

FIRE MANAGEMENT PLAN
for
VOYAGEURS NATIONAL PARK



United States Department of the Interior
National Park Service
Voyageurs National Park
International Falls, Minnesota

FIRE MANAGEMENT PLAN
for
VOYAGEURS NATIONAL PARK

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SECTION I. INTRODUCTION

This plan updates and replaces the Fire Management Plan (FMP), first developed in 1989. This update is necessary due to recent changes in the General Management Plan (2001), the recent revision of the Interim Resource Management Plan (2001); the results of a vegetation workshop held in October of 2001, which set new target conditions for vegetation management in the Park; and changes in both national Federal Fire Policy and National Park Service fire policy.

A. Reasons for Developing This Plan

This plan outlines those actions that will be taken by Voyageurs National Park in meeting the fire management goals for the area including the requirement in DO-18 that all park units with vegetation capable of sustaining fire develop a fire management plan.

B. Resource Management Link

This plan is a detailed program of action to carry out fire management policies and will help achieve resource management objectives as defined in the General Management Plan and further defined in the Interim Resource Management Plan (revised on November 28, 2001).

C. Compliance

This plan meets the requirements of the National Environmental Policy Act (NEPA) as documented in an environmental assessment's Finding of No Significant Impact (FONSI), which is located in Appendix D. Any additional prescribed burns and other fuels treatment projects beside those identified in the associated environmental assessment, will also have additional compliance work completed prior to project implementation. This will include biological assessments and cultural/historical site surveys as appropriate.

D. Authorities for Implementing This Plan

Authority for carrying out a fire management program at Voyageurs National Park originates with the Organic Act of the National Park System (August 25, 1916). This Act states that the primary goal of the National Park Service is to preserve and protect the natural and cultural resources found on lands under its management in such manner as will leave them unimpaired for future generations.

The Management Authorities (Directors Order DO-18, November 1998 and Reference Manual RM-18, February 1999) are the guiding documents for fire management plan implementation.

Service wide fire management policy is expressed in the current revisions of the Directors Orders and attendant Reference Manual for the National Park Service, "The Wildland and Prescribed Fire Management Policy: Implementation and Reference Guide"(USDI/USDA, 1998), and the

Review and Update of Federal Wildland Policy (USDI/USDA, 2001), and is incorporated herein by reference. The Park's fire management objectives conform to the referenced documents.

SECTION II. NPS POLICY AND RELATION TO OTHER PLANS

A. NPS Management Policies Concerning Fire Management

Director's Order # 18 states that: "Wildland fire may contribute to or hinder the achievement of park management objectives. Therefore, park fire management programs will be designed to meet resource management objectives prescribed for the various areas of the park and to ensure that firefighter and public safety are not compromised. Each park with vegetation capable of burning will prepare a fire management plan to guide a fire management program that is responsive to the park's natural and cultural resource objective and to safety considerations for park visitors, employees, and developed facilities."

In short, it is the policy of the National Park Service to allow natural processes to occur to the extent practical while meeting park unit management objectives. It is the task of this fire management plan to state how this balance will be achieved.

B. Enabling Legislation and Purpose of Voyageurs National Park

Voyageurs National Park (Figure 1) was authorized in 1971 (84 Stat. 1971, and amended in 1983 by Public Law 97-405) and established in 1975 "to preserve, for the inspiration and enjoyment of present and future generations, the outstanding scenery, geological conditions and waterway system which constituted a part of the historic route of the Voyageurs who contributed significantly to the opening of the Northwestern United States."

- **The purposes of Voyageurs National Park**, according to its legislation, are as follows: Preserve the scenery, geologic conditions, and interconnected waterways within the park for the inspiration and enjoyment of people now and in the future. Commemorate the voyageurs' routes and fur trade with the Native peoples of the north, which contributed significantly to the opening of northwestern North America to European settlement. Preserve, in an unimpaired condition, the ecological processes, biological and cultural diversity, and history of the northwoods lakecountry border we share with Canada. Provide opportunities for people to experience, understand, and treasure the lakecountry landscape — its clean air and water, forests, islands, wetlands, and wildlife — in a manner that is compatible with the preservation of park values and resources.
- **Values to be protected:** The waterways of Voyageurs National Park include one of the most important segments of the fur trade route used in the opening of northwestern North America. Located near the headwaters of the Arctic watershed of Hudson Bay, the park's lakes — rather than land — have been the primary travel route throughout history. The lakes continue to shape transportation and recreational uses of the area today. The park's exposed rocks and landscape exemplify the glacial activity of the Pleistocene epoch and some of the most complete and extensive Precambrian geologic features in the United States. The park preserves the timeless beauty of woods, rocks, water, and sky that invite

people to renew themselves through a variety of outdoor activities. The designation of Voyageurs as a national park is integral to the protection of the boundary waters ecosystem by both the United States and Canada. Along with Quetico Provincial Park and the Boundary Waters Canoe Area Wilderness, Voyageurs was and remains at the heart of a major conservation effort to protect the boreal forest landscape, its interconnected waterways, and associated wildlife (Figure 2). Voyageurs National Park holds vital evidence of the continuity of 10,000 years of human relationships with the environment uniquely dictated by the interconnected waterway system. The park provides an exceptional, largely unstudied storehouse of knowledge for the future and preserves resources associated with a long period of use, including those representing the fur trade, Native Americans, logging, and recreation.

C. Fire Management Objectives of Voyageurs National Park General Management Plan

“Natural fire regimes will be reestablished to the greatest extent possible, without unduly reducing visitation or visitor enjoyment.”

“Management objectives will be achieved through wildland fire use and prescribed fire.”

D. Fire Management Objectives of Voyageurs National Park Interim Resource Management Plan

Goal:

Fire is used as a tool to achieve resource management objectives, including but not limited to sustaining a healthy, natural ecosystem in fire-dependent vegetation types; controlling invasive and exotic species; reducing fire risk; restoring or reducing selected vegetation communities; maintaining vistas; and preparing seed beds.

Issues:

Narrow fire prescription window.

Fires are small in extent. There have been few large, landscape-scale fires at Voyageurs.

Resource Strategies:

Revise fire management plan to support a broader range of resource management objectives, including restoration of fire as a natural ecological process. Use wildland fire and prescribed fire to achieve established management objectives.

Mimic natural fire regimes to the greatest extent possible without unduly reducing visitation or visitor enjoyment.

Coordinate with adjoining land management agencies on multi-jurisdictional large-scale burns.

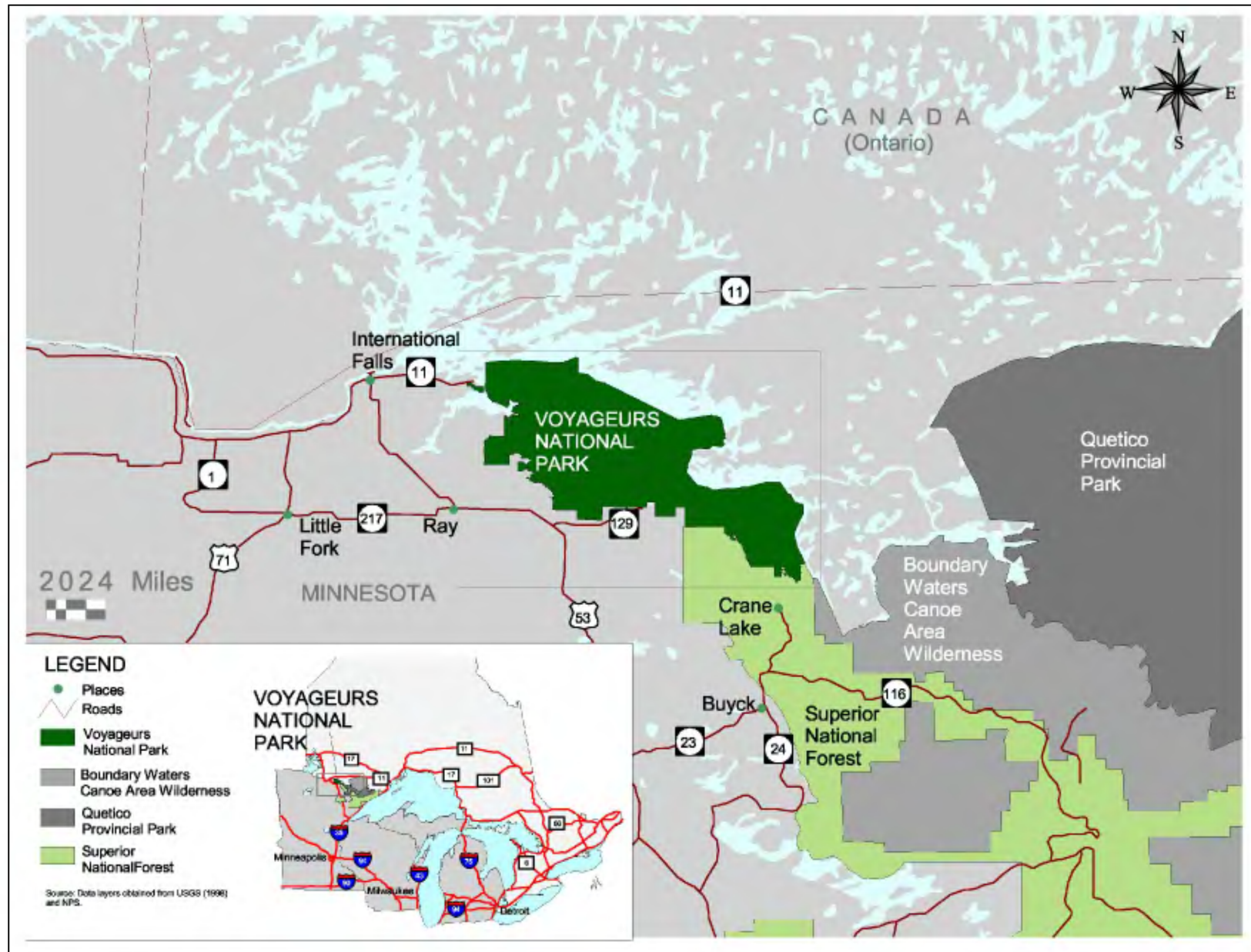


Figure 1 – Regional Context of Voyageurs National Park

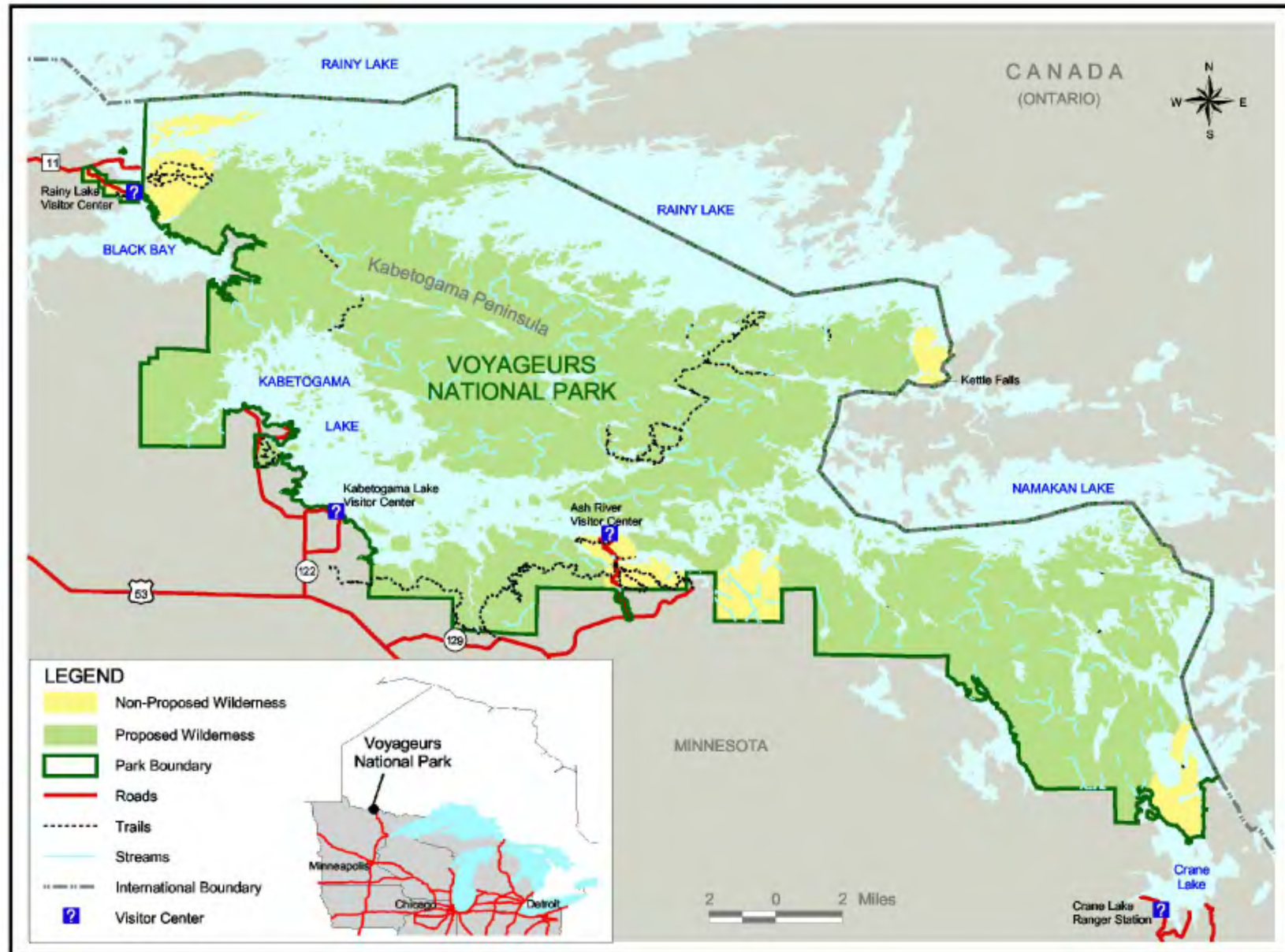


Figure 2 – Voyageurs National Park Vicinity Map

E. How the Fire Management Plan will Help Voyageurs National Park Meet General Management Plan and Resource Management Plan Objectives

Implementation of the Fire Management Plan will support Voyageurs National Park General Management Plan and Resource Management Plan objectives by specifying an array of fire management strategies designed to help to reestablish natural fire regimes to the extent possible while providing for the prevention of undesirable effects to people and resources from unwanted wildland fires.

The Fire Management Plan for Voyageurs National Park is a detailed program of action to carry out fire management policies and objectives.

SECTION III. SCOPE OF WILDLAND FIRE MANAGEMENT PROGRAM

A. Fire Management Plan Goals and Management Actions

The following fire management goals would apply to this FMP:

1. Perpetuate, restore, replace, or replicate natural processes to the greatest extent practicable.
2. Allow fire to play a role in sustaining the vegetation.
3. Use fire to accomplish resource management objectives, including hazard fuel reduction.
4. Protect human life, property and resources both within and adjacent to park areas from unwanted fires.
5. Protect natural and cultural resources from unacceptable impacts attributable to fire and fire management activities.

The following management actions will be undertaken in support of these above goals:

1. Preserve and expand the area in pine types.
2. Perpetuate the park's boreal forest components.
3. Maintain diversity of age classes and vegetation types to provide habitat for a diversity of wildlife, but without emphasis on any single species.
4. The public likes to see large trees, so efforts will be made to preserve large trees, especially in high visitor use areas.
5. Manage cultural landscapes as appropriate.
6. Hazards to park visitors or staff, or to properties outside the park's boundary, may be at risk from vegetation conditions inside the park. In these cases, specific management actions, determined on a case-by-case basis, may be taken to reduce the risk.

7. Specific management actions may be implemented in the case of species or communities that are threatened, endangered, rare, invasive, exotic, or otherwise of special concern.

B. Wildland Fire Management Strategies to be Applied

1. Wildland Fire

- a. Wildland Fire Suppression: All unwanted wildland fires will be suppressed using an appropriate management response. Management responses to specific wildland fires will be determined through evaluation of public and firefighter safety, fire behavior, values at risk, potential suppression damage, and availability of fire management resources. Management responses will vary from fire to fire and sometimes even along the perimeter of a fire. Appropriate management response options range from monitoring without on-the-ground disturbance to intense suppression actions on all perimeters of the fire.
- b. Wildland Fire Use(WFU): Voyageurs National Park utilizes the strategy of managing some naturally-ignited wildland fires for resource benefits. This strategy is an option only in the Wildland Fire Use Unit. Wildland fire use is a strategy for allowing some lightning-caused fires to burn as long as the fire meets predetermined resource management objectives in a predetermined geographic area, and within prescribed weather and fire behavior parameters. An ongoing or potential “wildland fire use” fire that does not meet predetermined prescriptions or fails to meet resource management objectives will be suppressed using an appropriate management response. Current policy allows management for resource benefits of portions of a fire perimeter, while other portions of the perimeter of the same fire are managed with an appropriate suppression response.

2. Fuels Management

- a. Hazard Fuel Reduction: The intent of this strategy is to reduce wildland hazardous fuel situations (caused by insect, disease, wind or heavy biomass accumulation), and maintain a fuel level that ensures protection of life, property, cultural values, and natural resources. The primary tool to accomplish hazardous fuel reduction will be the use of prescribed fire. In addition, various non-fire treatments utilizing mechanical and/or chemical treatments will be used in areas not suited for prescribed fire.
- b. Ecosystem Management: Prescribed fire will be used in support of ecosystem management to maintain and/or restore plant communities, cycle nutrients, reduce or remove exotic plants, and for a variety of other resource management objectives.

C. Fire Management Units (FMUs)

Voyageurs National Park has established two fire management units (FMU)(Figure 3). They are the Wildland Fire Use FMU, and Prescribed Fire/Suppression FMU. Each unit has a unique set of fire management objectives that can be met by a specific prescription. The boundaries of the park's fire management units are natural barriers, such as lakes and beaver ponds, that prevent fire spread or at least provide a reasonable chance for fire containment.

Conditions common to all Voyageurs National Park Fire Management Units:

1. Historic Role of Fire

According to Heinselman (1996), Voyageurs National Park occupies an ecotone, or zone of transition between the Great Lakes Forests to the south and southeast (characterized by red and white pine, basswood, red maple, northern pin oak, red oak, among others); and the true boreal forest to the north (characterized by black and white spruce, jack pine, balsam fir, tamarack, trembling aspen, paper birch and balsam poplar). He referred to this zone as the “southern boreal forest”. Most of the vegetation in this forest are fire adapted to one degree or another and some may be said to be truly fire dependent (red and jack pine in particular). Fire regimes for Voyageurs National Park are essentially the same as those extensively documented first by Heinselman and more recently by Frelich (2000) from which the following table is taken:

Table 1 – Fire Regimes and Soil Characteristics of Historical Forest Types in Voyageurs National Park

HISTORICAL FOREST TYPE	SOIL CHARACTERISTICS	FIRE REGIME
Red and White Pine	Poor-good/shallow-moderately deep	Mixed regime: infrequent stand-killing fires (150-300 year fire interval), with frequent stand-maintenance surface fires (20-40 year fire interval)
Jack pine, aspen, and black spruce	Poor/shallow	Frequent stand-killing fires (50-100 year intervals)
Aspen-birch, spruce, and fir	Good/moderate depth	Frequent stand-killing fires (50-100 year intervals)
White cedar, fir, black spruce, and paper birch	Various	Infrequent stand-killing fires (>200 year fire interval); depends on sheltering topographic features or chance lack of fire in any of the previous three forest types
Lowland black spruce	Deep nutrient-poor peat	Infrequent stand-killing fires (150-300 year interval)

Heinselman’s work in the nearby Boundary Waters Canoe Area Wilderness (BWCAW) as well as studies done for the Quetico Provincial Park, have established a natural fire rotation or “ fire cycle” of 75-100 years whereby an area equivalent to the entire area

burned during this period. Jakala (1994) has calculated the average acreage burned per year for a 75 year fire cycle to be 1.33% of the land base of Voyageurs National Park or 1,378 acres/year out of the 103,384 burnable acres (where vegetation type and soil moisture conditions are conducive to a fire starting and spreading). Before the current fire use program (including wildland fire use and prescribed fire) began in 1989 the estimate of the fire cycle was 1,500 years with an average of only 67 acres burned per year. From 1989 to 2001, and including all types of fire, the fire cycle at Voyageurs has been reduced to 305 years or 339 acres per year which, while a significant improvement, is still barely within the upper limits of the ordinary life span of red and white pine (300-350 years) and still well outside that of jackpine (150-200 years).

Significant changes have occurred in the species mix, extent and condition of these forests since the onset of European settlement in the 1800's. Logging of the red and white pine followed by slash fires reduced the pines and increased the boreal components. Large-scale formal fire suppression efforts have been largely successful in reducing the frequency and patch size of fire as a disturbance factor. Of particular consequence has been the almost total exclusion of the low-moderate intensity fires required by red and white pine to maintain a relatively open understory and to prepare seedbeds for natural regeneration. Invasion of flammable shade-tolerant species like balsam fir have in many cases created fuel ladders whereby surface fires which in the past would have been survivable by the thick barked pine species, can now climb into the crowns creating high intensity fires which can remove the pine seed source as well as being more difficult to control. Because of the lack of fire, there is very little natural regeneration of pine occurring and since the older stands are being invaded by shade tolerant spruce and fir which make them more susceptible to high intensity crown fires; the red and white pine in the park is considered to be high risk and the park's prescribed fire program has targeted this type for treatment since its inception in 1989. Jack pine is also considered high risk due to fire exclusion to the extent that there is very little of it in young age classes and is in danger of being replaced by spruce and fir. Jack pine's requirements for high intensity, stand replacement fire make it a challenge to prescribe fire within parameters which meet resource objectives and which can be accomplished safely.

2. Wildland Fire Management Situation

- a. Historical Fire Weather Pattern: Voyageurs National Park is located within the Great Lakes fire climate region characterized by long, cold winters and warm, moist summers. Average annual precipitation is around 24 inches, most of it occurring in the snow free time of the year. Because of this, waiting times between "fire stopping" rain events define the number and severity of fires during the season. Fire season generally lasts from mid- to late-April, through mid-October, with peaks in the spring and late summer/fall. Fires can and do occur during mid-summer but are less likely to be severe unless drought conditions are present. The main precipitators of fire weather conditions are large, dry high pressure systems from Canada which become warmer and drier as they move southward. These patterns may set up over the region for one to two weeks, drying out the fuels. When the high breaks down, it is often followed by a cold

front with winds, thunderstorms, and lighting. Even if the front brings rain, the preceding winds can generate a “one-run” fire which is capable of moving several miles before conditions moderate.

- b. Fire Season: The fire season in Voyageurs National Park begins on April 24th and extends through September 27th. These dates represent the first and last week, respectively, in which fire numbers are greater than or equal to 10 percent of peak fire activity in the park and vicinity (Haines et al. 1975). The beginning and ending dates of fire season may be modified to adjust to an early or late winter, an early or late spring, or lack of snow cover during an unusually dry winter.
- c. Fuel Characteristics: Fuels in the park can best be divided into four broad categories: conifer, mixed conifer/hardwood, hardwood, and wetland species. Live fuel flammability in the park is generally limited to conifer species. These species affect fire spread by torching, spotting and crowning. Voyageurs National Park has been mapped using both the NFFL fuel models and the fuel types of the Canadian Forest Fire Behavior Prediction System (FBP)(Forestry Canada Fire Danger Group 1992). These maps are found in Appendix I.

Conifer. Conifer stands found in lowland sites (generally black spruce, balsam fir and white-cedar) are best described by fuel model 8 and normally act as a fuelbreak. During very dry years, however, fire spread can occur and organic soils can pose a mop-up problem as well as add to fuel availability. Upland stands of jack pine, red and white pine, and spruce-fir are most flammable while in immature stands. High flammability and the presence of ladder fuels can cause torching and intense crowning, better represented by fuel model 4. In well-stocked mature stands, however, needle litter is the main carrier of fire with less of a fuel ladder in the pine species to carry fire to the crowns; fuel models 8 and 9 are representative. Overmature stands and stands damaged by windthrow or insect infestations can contain large amounts of dead and down fuels and when present on shallow soil sites or during dry years can be susceptible to high intensity fires; best described by fuel model 10. Representative Canadian FBP fuel types include C-3, mature jackpine; C – 1, spruce lichen woodland; C – 2, boreal spruce; and C-5, red and white pine.

Mixed Conifer/Hardwood. Mixed conifer/hardwood stands include aspen, birch, spruce and fir in any combination. Depending upon fuel loading, stands of mixed conifer/hardwood are represented by fuel models 8 or 10. Surface and/or crown fires can occur in any of these types. Spruce-fir areas provide ladder fuels with low-hanging branches and birch bark provides the ideal vehicle for spotting long distances. Periodic insect infestations create jackpots of dead aerial and surface fuels. Mop-up efforts can be hampered by the heavy fuels and soil conditions. Representative Canadian FBP fuel types include M – 1 and M – 2, mixed wood leaf off and greenup respectively.

Hardwood. During the leaf-off period, dead grass, leaf litter and other surface fuels provide the primary means for fire spread in hardwood stands. Increased solar radiation and unrestricted wind movement accelerate the drying of dead and down fuels. Fires are normally surface fires better represented by fuel model 2. When hardwood leaves are present, however, surface fuels are generally unavailable due to shading and the resultant higher fuel moistures. At this time, fuel model 8 is more representative. Representative Canadian FBP fuel type is D-1.

Wetland. Wetland includes such areas as marsh, meadow, slough, stream course, leatherleaf bog, shrub carr, and black spruce bog. Fires rarely occur during the summer unless the water table is low, thus allowing ground fire in the organic soil or surface fire in fine fuels. Cured marsh grasses can support running fire in the spring and fall. For fires burning in marsh, meadow, slough, stream course, leatherleaf bog, or shrub carr communities, fuel models 2 or 3 will be used. CFFDRS model is O-1b for standing grass. Black spruce sphagnum bog is generally too wet to burn except during extreme drought when fire is essentially a ground fire burning slowly through the organic soil. However, under the right circumstances, an independent crown fire can carry through a lowland black spruce stand if there is no break between the canopy of upland conifer and the lowland black spruce. Where there is significant leatherleaf and/or feather mosses present under the black spruce, NFFL fuel model 5 or Canadian FBP fuel type C-2 would be used.

- d. Fire regime alteration: Of the five fire regimes listed in Table 1 above, the first 3 have been most significantly altered. In general, flammability has increased in the first two due to hazardous fuel accumulations. In the aspen, spruce-fir forest type, there has been a decrease in flammability due to recent logging activities before establishment of the park in 1974, which increased the aspen component and reduced the conifer component in places. With time, natural succession will lead to a steadily increasing conifer component which will in turn, increase the flammability within this type. In places where logging has not altered the aspen-spruce-fir forest type, fire exclusion has affected spruce budworm outbreak frequency due to increases in balsam fir, its preferred food source. Fir is very fire sensitive and in the absence of fire has increased its density throughout northeastern Minnesota. Corresponding to this increase has been an increased frequency of budworm outbreaks (MnDNR, 1996; Frelich, 2001). The latter two fire regimes are long enough that they have not yet seen the effects of fire exclusion.
- e. Control problems: Control problems are often associated with the increased balsam fir component in the understory of all of the forest types. In its live form, it creates a "fuel ladder" which can carry fire from the surface into the crowns of red and white pine. When killed by spruce budworm, the balsam tends to "jackstraw", adding increased dead, down woody fuel to the forest floor which

increases fire intensity and resistance to control. In some cases, both situations are present creating fires which torch and crown easily and have high surface fuel loads as well. Dead fir also acts as a host to arboreal lichens which are quite flammable and act as an excellent spotting mechanism. Paper birch is also a notorious source of fire brands for spotting.

- f. Values to be protected: In addition to Park improvements, and values of concern identified in the Resource Management Plan, there are 63 tracts totaling 1,482 acres in private ownership of which 41 tracts are improved with summer residences. These tracts are of special concern for wildland fire suppression and for hazardous fuel reduction work. Administrative sites, campgrounds and other improvements are to be protected. Protection and expansion of pine forests, protection of big trees especially in high visitor use areas, and protection of archeological and historic cultural sites are all priorities for protection at Voyageurs. Any known threatened, endangered, rare, or sensitive species and cultural sites will be acknowledged and mitigated for during prescribed fire operations. As a federally mandated Class I area, Voyageurs' airshed is of concern for increased smoke impacts. These will be mitigated for in all prescribed fire operations and monitored and mitigated to the extent possible on Wildland Fire Use fires.

D. The Wildland Fire Use FMU

1. Physical Description

The Wildland Fire Use FMU comprises a significant portion of the park area, specifically covering the majority of the Kabetogama peninsula to a line north from Mica Bay through Ryan Lake to Rainy Lake. Because of the extensive lakes bordering it, which serve as natural fire breaks, the unit maximizes the area in which naturally-ignited fire may be used regularly as a management tool to perpetuate and maintain fire-adapted park ecosystems.

2. Fire Management Objectives

Note: A vegetation management plan for Voyageurs National Park is currently being developed which will establish long term vegetation target conditions. These target conditions will provide the basis for future fire management objectives. Current objectives for this FMP are based on maintenance of the present vegetation proportions while improving the conditions of red and white pine stands through hazard fuel reduction. Further monitoring objectives are found in the Monitoring Plan located in Appendix F.

Strategic Objectives:

Lightning-caused fires in this FMU are allowed to burn in the unit under prescribed conditions unless they threaten human life, private property, other critical park resources and objectives, to escape from the management unit, or to violate air pollution control laws and regulations.

Wildland fires are managed with the appropriate management response as directed by this fire management plan and analysis of the specific situation.

Prescribed fires are also used in the Wildland Fire Use FMU to accomplish resource management objectives, such as encouraging pine regeneration or creating wildlife habitat and fuel hazard reduction objectives, such as removing fuel ladders and downed woody debris from the sub-canopy of red and white pine stands.

Mechanical fuel treatment methods are occasionally used for hazardous fuel reduction in areas where safe and effective prescribed fire treatment is precluded by fuel loads, or is otherwise unfeasible.

Measurable Objectives:

Ensure all wildland fire and prescribed fire operations sustain no injuries to members of the public and limit any injuries to firefighters to no more than 90% of the past fire year average.

Initial AMR strategy for unwanted wildland fire is successful 97 % of the time.

Natural fire rotation or fire cycle is reduced by a combination of prescribed fire and wildland fire use to 150 years or less in 5 years.

Treat 3,649 acres (or 6% of the FMU) with prescribed fire in the next 5 years to achieve park resource management objectives.

3. Fire Management Constraints

All fire management activities will consider safety of personnel and the public as the highest priority.

Smoke management procedures for burning in Minnesota will be followed for all prescribed fire operations.

Minimum Impact Suppression Tactics (MIST) will be employed.

Protection and mitigation measures for known historic and cultural resource sites in or near the project area must be assured before a prescribed fire project is initiated and during Wildland Fire Use fires.

Park neighbors, park visitors and local residents will be notified of all planned and unplanned fire management activities that have the potential to impact them.

All personnel involved in fire management operations will receive a safety briefing describing known hazards and mitigating actions, current fire season conditions and current and predicted fire weather and behavior.

Only properly trained and qualified personnel will carry out fire management operations.

4. Historic Role of Fire

See Conditions Common to all FMUs.

5. Wildland Fire Management Situation

Historical Fire Weather Pattern: See Conditions Common to all FMUs.

Fire Season: See Conditions Common to all FMUs.

Fuel Characteristics: See Conditions Common to all FMUs.

Fire Regime Alteration: See Conditions Common to all FMUs.

Control Problems: See Conditions Common to all FMUs.

Values to be Protected: See Conditions Common to all FMUs.

E. Prescribed Fire/Suppression FMU

1. Physical Description

The Prescribed Fire/Suppression FMU, is located in areas where the risk of fire escape beyond park boundaries is higher than the Wildland Fire Use FMU, encompassing primarily the area along, and contiguous with, the west and southern boundaries of the Park where there is no natural barrier to fire spreading across Park boundaries to surrounding lands, and the area in the southeastern corner of the Park bordered by Crane Lake and Sand Point Lakes to the east and Namakan Lake to the north. In addition, incorporated within the Prescribed Fire/Suppression FMU are developed sites such as Black Bay Narrows, State Point, Kabetogama Lake Visitor Center, Ash River Narrows, Ash River resorts, Hoist Bay, and Kettle Falls. Also incorporated in such units are all developed campsites and day use sites, docks and bulletin boards at trailheads, private lands, and private and retained use and occupancy cabin sites. Also incorporated in this FMU are all the islands in the park.

2. Fire Management Objectives

Note: A vegetation management plan for Voyageurs National Park is currently being developed which will establish long term vegetation target conditions. These target conditions will provide the basis for future fire management objectives. Current objectives for this FMP are based on maintenance of the present vegetation proportions while improving the conditions of red and white pine stands through hazard fuel reduction. Further monitoring objectives are found in the Monitoring Plan located in Appendix F.

Strategic Objectives:

The Prescribed Fire/Suppression FMU will provide intensive protection for human life and property within and outside park boundaries.

All lightning and human-caused unwanted wildland fires originating from within or that threaten the Prescribed Fire/Suppression FMU from outside are suppressed (managed) with the appropriate management response and analysis of the specific situation. Mechanical fuel manipulation with powered hand tools and prescribed fire are used to reduce fuels and accomplish vegetation management objectives.

A prescribed fire program is utilized within this FMU to accomplish resource management objectives, such as encouraging pine regeneration or improving wildlife habitat and fuel hazard reduction objectives, such as removing fuel ladders and downed woody debris from the sub-canopy of red and white pine stands. To the maximum extent possible, this program tries to simulate the effects of the natural fire regime on the plant and animal communities within unit boundaries. The objective of this program is to simulate the severity and intensity of natural fires at times and places when safety and control can be assured.

Prescribed fire is utilized according to a pre-determined set of parameters. Prescribed fires can be ignited in designated prescribed fire units under specific prescriptions. The required prescriptions are described in each unit's prescribed fire plan. Prescribed fires may be carried out at any time of the year when conditions are within prescription and operations will not conflict with control activities. When conditions are not within these parameters, fires initiated will be suppressed or not used.

Priorities for use of prescribed fires are determined by the length of time since previous burn, current fuel loading and vegetative conditions, topographic advantage, and by personnel and logistical requirements. To the extent feasible, prescribed fires are conducted with the direct aid and cooperation of the agency or agencies whose lands are contiguous with the burn unit.

Mechanical fuel treatment methods are regularly used for hazardous fuel reduction in areas where safe and effective prescribed fire treatment is precluded by fuel loads, or is otherwise unfeasible.

Measurable Objectives:

Ensure all wildland fire and prescribed fire operations sustain no injuries to members of the public and limit any injuries to firefighters to no more than 90% of the past fire year average.

Initial AMR strategy for unwanted wildland fire is successful 97% of the time.

Ensure fire does not destroy any administrative structure, nor incur costly damage (rehabilitation costs greater than \$10,000) to any cultural or historic site.

Annually review and modify as necessary agreements with neighboring agencies and fire departments.

Treat 3,117 acres (or 5% of the FMU) with prescribed fire in the next 5 years to achieve park resource management objectives.

3. Fire Management Constraints

All fire management activities will consider safety of personnel and the public as the highest priority.

Smoke management procedures for burning in Minnesota will be followed for all prescribed fire operations.

Minimum Impact Suppression Tactics (MIST) will be employed.

Protection mitigation measures for known historic and cultural resource sites in or near the project area must be assured before a prescribed fire project is initiated.

Park neighbors, park visitors and local residents will be notified of all planned and unplanned fire management activities that have the potential to impact them.

All personnel involved in fire management operations will receive a safety briefing describing known hazards and mitigating actions, current fire season conditions and current and predicted fire weather and behavior.

Only properly trained and qualified personnel will carry out fire management operations.

4. Historic Role of Fire

See Conditions Common to all FMUs.5. Wildland Fire Management Situation

Historical Weather Analysis: See Conditions Common to all FMUs.

Fire Season: See Conditions Common to all FMUs.

Fuel Characteristics: See Conditions Common to all FMUs.

Fire Regime Alteration: See Conditions Common to all FMUs.

Control Problems: See Conditions Common to all FMUs.

Values to be Protected: See Conditions Common to all FMUs.

INSERT MAP

Figure 3 – Fire Management Units

SECTION IV. WILDLAND FIRE MANAGEMENT

A. General Management Considerations

The Voyageurs National Park General Management Plan (GMP) and Interim Resource Management Plan (RMP) have identified areas and priorities to be considered when determining the appropriate management response (AMR) to a wildland fire occurrence. The range of appropriate management responses will be based on objectives for the area, relative risk (immediate and external influences), complexity and defensibility of management boundaries. To assist in determining appropriate management response and strategies/tactics to implement, fire managers will utilize the “Appropriate Management Response” chart found in the Policy and Implementation Procedures chapter of the Wildland and Prescribed Fire Policy Implementation Guide. This chart uses objectives, relative risk, complexity, and defensibility of management boundaries to help determine the range of AMR.

1. In light of the GMP objective that “Natural fire regimes will be reestablished to the greatest extent possible, without unduly reducing visitation of visitor enjoyment,” the full range of fire management options will be utilized at Voyageurs. Consequently, appropriate management responses are not automatically focused on limiting fire size. Rather, they will be based on:
 - Public and firefighter safety
 - Cost expenditures commensurate with values to be protected
 - Protection of cultural, historic and natural resources from fires
 - Limiting fireline construction through use of natural barriers such as lakes, streams and lowlands
 - Protection of Park improvements (buildings, campgrounds, etc.)
 - Preventing fire spread from the Park onto private lands
 - Air quality within developed areas near the Park
2. The Wildland Fire Implementation Plan (WFIP), Stage I, provides the decision framework for selecting the appropriate management response. The Stage I analysis includes the initial fire assessment and the go/no go decision criteria checklist. It documents the current and predicted situation and all appropriate administrative information. It also provides the manager with decision criteria to make the initial decision of whether to manage the fire for resource benefits or to take suppression action. (Refer to Chapter 4 Policy and Implementation Procedures of the Wildland and Prescribed Fire Policy Implementation Guide .)

B. Wildland Fire Use

1. Objectives of Wildland Fire Use

The primary objective of the Wildland Fire Use (WFO) program is to allow restoration of naturally-ignited fire as an ecological process and natural disturbance agent within

Voyageurs National Park without unduly reducing visitation or visitor enjoyment. Fire will be used to reduce the density of vegetation, restore age-class and vegetation type mosaics and reduce flammability. Wildland Fire Use will only occur in the Wildland Fire Use FMU.

2. Decision Criteria for Wildland Fire Use

Fires ignited by lightning in Voyageurs National Park's Wildland Fire Use FMU will be allowed to burn and managed as a WFU fire if they satisfy the Decision Criteria (initial Go/No-Go Decision) contained in the Stage One WFIP as found in the Implementation Guide. Reassessment of the WFU fire is made daily when the fire is actively burning (i.e. spreading) or as determined and documented in Stage II and/or Stage III of the WFIP. Periodic reassessment will be made when the fire is inactive but has not been declared out. Fires ignited by lightning outside of Wildland Fire Use FMU will be suppressed using the appropriate management response according to the procedures in the wildland fire mobilization section of this plan

Lightning fires that are managed as a WFU fire will be continually monitored and evaluated, using the Periodic Fire Assessment Re-Validation Checklist within the WFIP, from the time of discovery until they are declared out. Lightning ignitions that do not satisfy these decision elements within the Re-validation Checklist will be reclassified as unwanted wildland fires and an appropriate management response will be taken according to a Wildland Fire Situation Analysis (WFSA). A variety of holding actions are appropriate to keep a fire managed for resource benefits within planned boundaries. The level of holding activity that will be acceptable before a fire is declared an unwanted wildland fire will be determined on a case-by-case basis and these thresholds documented within the Wildland Fire Implementation Plan. Local indicators of potential "watchout" situations when holding activities may threaten to become suppression actions include, but are not limited to: when more than two crews of 20 people each from outside the park are on the firelines; when aerial retardant drops are necessary, or when confinement strategies to keep a fire within maximum manageable area (MMA) boundaries fail and direct attack on the fire is necessary.

If WFU fires remain within acceptable criteria as determined in the WFIP, some fires may be allowed to burn for several months or longer without direct control or until extinguished by rain or snow. It is important for the public to understand the National Park Service is not letting fires burn indiscriminately, but that fires are managed under strict predetermined criteria. The fire monitoring system described below will ensure that these criteria are met and will keep a close watch on a fire's progress.

The standard Decision Criteria Checklist in the Implementation Guide lists detailed explanations of each of the decision elements. Voyageurs National Park has developed additional indicators to assist the decision maker in evaluating the Criteria. These are listed in Figure 4 following each of the standard decision elements:

Figure 4 -- Decision Criteria Checklist

Is there a threat to life, property, or resources that cannot be mitigated?

- Fire within WFU Fire Management Unit
- Unit (or MMA once established) boundary threatened and available holding resources not able to mitigate
- Threat to life and/or property within or outside the management unit

Are potential effects on cultural and natural resources outside the range of acceptable effects?

- Impacts of fire on natural and cultural resources, the public, & local economies are acceptable

Are relative risk indicators and/or risk assessment results unacceptable to the appropriate Agency Administrator?

- Projected fire perimeter locations are acceptable
- Equipment & personnel available to allow for an increase in fire size and complexity
- Local/regional/national fire situation stressing interagency resources
- Buildup Index (BUI) below 57 and Drought Code (DC) below 327 (both are used to evaluate fire starts only) (See also CFFDRS/NFDRS firefighter pocket card: Appendix G.5)

Is there other proximate fire activity that limits or precludes successful management of this fire?

- More than five 10+ acre fires within the park

Are there other Agency Administrator issues that preclude wildland fire use?

- Qualified Fire Use Manager available to manage fire
- Potential size of fires burning within the park is acceptable and manageable
- Short-term fire weather and/or fire behavior are acceptable
- Long-term fire weather and/or fire behavior are acceptable
- Effects of regional drought on fire behavior/size are acceptable
- Smoke dispersal and direction are acceptable

3. Preplanned Implementation Procedures

Any WFU fire that has the potential (as determined by fire behavior predictions based on fire weather forecasts) to reach the following areas within two burning periods will automatically require a Stage III assessment:

- FMU boundary east of Ryan Lake along the line between the Wildland Fire Use FMU and Prescribed Fire/Suppression FMU.
- FMU boundary near Namakan Narrows (south of Mica Bay to Johnson Bay)
- FMU boundary near Brule Narrows (from Soldier Point west to Lost Bay on Rainy Lake)
- FMU boundary along Gold Portage
- FMU boundary near Ash River Narrows (from Tar Point west to Round Bear Island)

4. Non-Preplanned Implementation Procedures

MMA boundary establishment, Decision Criteria Checklist, Risk Assessment, Complexity Analysis are not pre-planned. All of these planning items will be detailed at the onset of a WFU project using the timelines established in the Implementation Guide.

- a. Periodic assessment procedures -- Assessment procedures and the Re-validation Checklist found in the Implementation Guide provide the guidance for periodic assessment procedures. Voyageurs National Park requires daily revalidation while a WFU fire is active (i.e., actively spreading). When a WFU fire becomes inactive (non-spreading) but has not been declared out, re-assessment and revalidation will occur once a week until either the fire becomes active again or is declared out.
- b. Requirements for preparation of Implementation Plans – The Wildland and Prescribed Fire Policy Implementation Guide will be the source and reference for the preparation of all plans and documentation for wildland fire use with the exception of the Voyageurs National Park WFU Decision Tree.

5. Potential Impacts of Plan Implementation

Wildland Fire Use can have both positive and negative impacts. Positive impacts are the benefits to forest development when fire is part of the natural processes which help provide for a balanced ecosystem. Socially, there is the potential for visitors to witness a natural event not often seen by the public, in relative safety from the water.

Negative impacts for fire use at Voyageurs would be mostly of a social nature. Smoke impacts to neighboring communities (see Section IV.E.2.b.) as well as Park visitors are a possibility although their effects are expected to be temporary. Any impact that reduces visitation will have economic impacts to the local communities which rely on tourism. This is expected to be a rare scenario with wildland fire use and, like all other potential negative impacts of wildland fires, could happen from an unwanted fire as well.

Another potential negative impact is to Park staff. Supporting these projects can require a substantial commitment of staff time. Use of outside resources and teams to supplement local staff will help to minimize this impact.

6. Staff Responsibilities for Wildland Fire Use Implementation

If wildland fire complexity escalates to Stage III of the WFIP, or during multiple Stage I/II fires, the staff of Voyageurs National Park will require assistance to manage the fire (Fire Use Manager(FUMA) and to complete fire spread modeling and Maximum Manageable Area (MMA) development (Long Term Fire Analyst (LTAN). These positions may be ordered separately or as part of a Fire Use Team.

Superintendent

Fire management in Voyageurs National Park is the responsibility of the Superintendent, with technical duties and accompanying responsibilities delegated to staff members. Is ultimately responsible for any fire occurring in the park. He/she is responsible for making the Go/No Go decision, signing the WFIP and periodic assessment to validate the WFIP decision. Declares park closures when needed. Will issue a written delegation of authority in the event a Fire Use Management Team is assigned to a WFU fire at Voyageurs National Park.

Chief Resource Management

Ensures that a comprehensive fire management program at the park is adequately planned for and implemented.

Chief Visitor and Resource Protection

With the Area Fire Management Officer, evaluates fire activity in terms of public and employee safety and makes recommendations to the Superintendent for closures. Patrols to ensure closures are enforced. Designs and implements the park evacuation plan at the discretion of the Superintendent.

Area Fire Management Officer

Ensures implementation of FMP and coordinates wildland fire and prescribed fire programs. Responsible for ensuring that the fire program is managed within RM-18 guidelines. Responsible for analyzing fire weather and fire season severity to support fire use decisions, preparing WFIP Stage I and Relative Risk Rating Chart on all candidate wildand fires. Provides technical assistance in respect to WFIP planning, staffing assistance in respect to monitoring and advisory assistance in terms of escalating staffing due to increases in complexity and fire behavior. Should be immediately notified of potential fire use projects during WFIP Stage I if not on location. Provides fire behavior predictions for Stage I and II WFU fires.

Ecoregional Fire Ecologist

Provides oversight to monitoring program. Provides input into MMA and long term risk assessment in accordance with Stage III.

Fire Program Assistant

Tracks expenditures for WFU fire projects. Provides Area FMO with financial package of the official project record.

Fire Management Committee

The Fire Management Committee consists of the Chief Visitor and Resource Protection, Chief Resource Management, Area Fire Management Officer, Cultural Resource Specialist, Chief Education and Planning, and affected District Ranger. Technical expertise from other staff members may be requested at any time. The Committee will evaluate all potentially natural fire starts in the Wildland Fire Use Fire Management Unit. The Area Fire Management Officer will present fire information to the Committee using the Wildland Fire Implementation Plan (WFIP) Stage I analysis. The fire will be evaluated as a candidate Wildland Fire Use fire according to the Fire Decision Flow Chart, prescription parameters, and Stage I analysis. The Committee will recommend to the Superintendent the appropriate management response. The Superintendent will sign the “GO” or “NO-Go” Recommended Response Action as part of the Stage I analysis.

The Fire Management Committee will receive regular updates from the Area Fire Management Officer as fire activity warrants. Should fire activity warrant a Stage III analysis, the Committee will be consulted and a recommendation made to the Superintendent.

Fire Use Management Team

The number of personnel required for an incident will vary. Management could range from a Stage I & II Fire Use Manager (Burn Boss II who has had S-580) and Fire Effects Monitor for a low complexity WFU fire; to a full Fire Use Management Team for a Stage III complexity fire. Staffing levels will be evaluated daily and adjusted as needed based on actual and predicted fire behavior, predicted weather, other fire activity, etc. Voyageurs’ WFU team consists of:

- **FUMA (Stage I & II)** – The Area FMO or qualified designee will generally serve in this position for Stage I and II complexity fires. Stage III complexity will require a FUMA (Stage III) be brought in should no one on the Voyageurs staff be qualified at this level. The FUMA facilitates the information gathering, analysis, planning and implementation of WFIP. Must be on site within 36 hours of a WFIP Stage I “go” decision.
- **Monitor** – Monitors and documents fire weather, behavior, fuel consumption and map location. Provides feedback to WFU Manager in terms of fire use and resource management objectives. Must be on site within 36 hours of a WFIP Stage I “go” decision.

External Resources

Support will be needed for Voyageurs National Park to implement stage III wildland fire use and many prescribed fires:

- NPS Fire Use Modules: can provide both planning and operational assistance

related to wildland fire use and prescribed fires.

- Local MNICS crews can assist with implementing prescribed fires.
- National Fire Use Management Teams can be ordered to manage Fire Use incidents.

7. Public Information

When WFU projects are implemented, information will be made available to the public to ensure understanding, acceptance, and support. Local media (newspapers, radio and television) will be provided with briefings and photo/interview opportunities and current fire information will be posted on the park website. Visitor information staff and rangers will be kept informed concerning WFU fire status. In addition, local cooperators will be kept informed. If WFU fire operation persists for extended periods and burns substantial acreages, consideration will be given to ordering a public information specialist. See Section X for additional public information procedures.

8. Wildland Fire Plans and Documentation

All designated WFU fires will be documented for the record and for future reference. Whenever possible, the perimeter of the fire will be mapped using Global Positioning System (GPS) or from field reconnaissance. All fire locations will be documented in the park's hard copy "Fire Atlas" as well as being entered into the park's Geographic Information System (GIS). Other records should include:

- WFIP and all amendments and revisions
- WFSA (if used)
- Monitoring reports and summaries of findings
- Revalidation and certification documents
- Fiscal reports
- Project maps
- Daily weather records
- Fire Behavior predictions
- Smoke emission and transport observations
- DI-1202 Fire Report
- Resource Orders used
- Other information as appropriate for the situation such as photos, video, photo points, etc.

9. Cost Tracking

All WFU fire costs will be tracked and documented in the fire record. Costs will include all personnel services, service contracts, aircraft, supplies and equipment procurement.

C. Wildland Fire Suppression

1. Range of Potential Fire Behavior

Due to the lack of complex topography, fires in Voyageurs National Park are essentially wind-driven. Slowly spreading surface fires with occasional torching are the norm with 20 feet windspeeds below 15 mph. Short-duration "mini-droughts" quickly dry out the

thin ridge top soils and crown fires will develop on the ridges if crown closure and windspeeds are adequate. Single burning period runs of 1.5 to 7 miles have been documented in the park and the nearby BWCAW respectively. While the presence of numerous lakes make effective firebreaks under low to moderate conditions, during extreme fire conditions, potential 1/4 to 1/2 mile spotting distance make all but the largest lakes ineffective in stopping forward spread.

2. Preparedness Actions

Preparedness includes those things that are done in advance of fire occurrence to ensure the ability of Voyageurs' fire management organization to initiate effective action, whether that is suppression (using the appropriate management response) or the evaluation and decision process for prescribed fire or wildland fire use. Preparedness activities include: recruitment, training, planning and organization, maintaining fire equipment, and procuring equipment and supplies. The objective of presuppression is to have a well-trained and equipped fire management organization to suppress unwanted wildland fires, manage WFU fires or apply prescribed fire in a safe, efficient manner. Preparedness activities are covered by normal park operating funds through Staffing Class III beyond which point emergency funds will then be authorized.

- a. Fire Prevention: Fire prevention includes all activities designed to reduce the number of human-caused wildland fires that occur in Voyageurs National Park. The objective of each fire prevention program is to minimize preventable fires within the park's fire management units. All fire prevention messages will explain the differences between human-caused wildland fires, WFU fires and prescribed fires with respect to impacts on the park ecosystem. All NPS and concession employees will possess a comprehensive understanding of this plan so that they can communicate to park visitors and neighbors the complementary programs for fire prevention and the use of prescribed fire. Detailed listing of major fire prevention activities are found in the Prevention Plan located in Appendix I.

The Minnesota Incident Command System (MNICS) member agencies (Minnesota Department of Natural Resources-Division of Forestry, the Chippewa and Superior National Forests, Bureau of Indian Affairs, U.S. Fish and Wildlife and Voyageurs National Park) have implemented a joint program that defines four classes of restrictions on open burning for northern Minnesota (see MNICS Mobilization Plan). The rationale for this approach is to reduce confusion among their various using publics by having the same restrictions apply on all federal lands as on state lands in northern Minnesota.

Restrictions implemented within Voyageurs National Park will be accomplished via a Superintendent's Closure. The closure will be displayed in such locations and manner as to reasonably bring the restrictions to the attention of the public. News releases will also be made informing the public of the restrictions.

- b. Annual Training: Annual training will consist of annual fire fighter safety refresher training, first aid and other safety training for appropriate individuals.

- c. Annual Preparedness Activities: Prior to and during the fire season, the following presuppression actions will be taken to ensure adequate fire preparedness. The responsible positions for meeting specific target dates are in parentheses.
- **September 28 through April 25** (Area Fire Management Officer). Qualified fire management personnel will be recruited and trained. Generally this is the period when most of the MNICS sponsored fire training courses offered within the state.
 - **January 1 through April 23** (Area Fire Management Officer, Lead Forestry Technician/AFMO, park EMT). All fire-qualified permanent personnel will take the pack test. Seasonals in all divisions who can be available for fire duty should be tested as they enter on duty; arrangements will be made by their particular supervisor. All redcarded firefighters will attend an eight hour annual refresher training.
 - **April 1 through September 27** (Area Fire Management Officer, Lead Forestry Technician/AFMO, Fire Program Assistant). Fire weather stations will be set up and operational by April 1 and readings taken until the fire season ends in the fall. Ten to 14 days of readings must be taken before fire weather forecasts are given by WIIMS.
 - **April 23** (Ecoregional Fire Ecologist, Area Fire Management Officer). A cadre of fire monitors (with a minimum of Firefighter II qualifications) will be available. Their training will include operation of belt weather kits, fuel typing, calculating rates of spread, estimating flame length and recognizing factors that contribute to blow-up conditions.
 - **April 23** (Lead Forestry Technician, Fire Crew). Inventory of all fire and fire-related equipment will be complete. Fire packs will be given to all redcarded employees. Ten packs will be reserved in the Fire Cache for other available fire personnel as needed.
 - **April 24 through September 27** (Lead Forestry Technician, Fire Crew). Fire equipment and supplies will be maintained in serviceable condition and in constant readiness. The Fire Management Crew along with District Rangers and Area Rangers will be responsible for the servicing and first echelon maintenance of fire equipment assigned to their respective areas. Defective or worn-out items will be replaced. Fire-fighting equipment is located at fire caches where NPS boats and contract aircraft are moored so that, in the event boats or float planes are used, the equipment will be readily available.
 - **April 24 through September 27** (Area Fire Management Officer, Lead Forestry Technician/AFMO, Fire Program Assistant). During fire season, all fire personnel and key fire overhead will provide the park Dispatcher with their availability during off duty hours should fire conditions warrant. Each employee subject to fire duty will have a fire pack available for immediate use.

- **April 24 through September 27** (park Pilot). The NPS fixed-wing aircraft will be available to assist in implementing the fire management program. The aircraft will be used for aerial reconnaissance following lightning storms, transporting personnel, equipment and supplies to fires, and aerial reconnaissance of ongoing fires. Additional aircraft are available through local contract aircraft, the Superior National Forest, Minnesota Department of Natural Resources, and Ontario Ministry of Natural Resources.
 - **April 24 through September 27** (Lead Forestry Technician/AFMO). Identified helispots located at Hoist Bay and off the Ash River trail will be maintained/mowed throughout the season to allow for safe helicopter operations.
 - **June 15** (Area Fire Management Officer, Lead Forestry Technician/AFMO). Fire training for seasonal employees will be completed.
 - **November 1 through November 15** (Lead Forestry Technician/AFMO). After the fire season ends, all equipment will be winterized. Worn out or missing equipment will be replaced.
- d. Fire Weather and Fire Danger – Voyageurs National Park maintains one permanent fire weather station at Kabetogama Volunteer Fire Station. This station is an automated station with telephone modem. Temporary stations are set up as needed in advance of prescribed fire projects. Catalog information are as follows:

Station	Name	Elevation	Aspect	Slope	Climate	NFDRS Fuel Model
210507	KABNAM	1200	Flat	1	3	G

While daily observations entered into WIIMS will track the NFDRS fuel mode G, the park will catalog and track the CFFDRS Indices using commercial weather station software.

Fire Danger Index – The Canadian Forest Fire Danger Rating System indicates the potential for and severity of a unwanted wildland fire occurrence (Stocks, et al 1989; Van Wagner 1987). The Fire Weather Index (FWI) will be used to indicate fire danger in the park. FWI is used as a numerical rating of fire intensity and is widely used as a general index of fire danger. The FWI indicates fire intensity by combining the rate of fire spread with the amount of fuel being consumed. It is similar to the NFDRS Burning index (BI) which most agencies use for staffing classes (Jakala, 2001). The fire weather index ranges in Table 2 were derived from a statistical analysis of 51 years of data from the International Falls National Weather Service Station. In addition, analysis using Firefamily Plus for the fire records since the park was established indicates good correlation between these break points and fire business.

In addition to FWI, as stated in Section IV.B, Buildup Index (BUI) and Drought Code (DC) will be used in the Go/No Go decision process to determine

Wildland Fire Use. The 90th percentile is used as the cut-off for new starts. DC and BUI are excellent indicators of drought and long-term fire danger.

While CFFDRS indices will be the primary indices utilized for decision making at Voyageurs, NFDRS indices will be tracked as well since they are familiar to most fire use and incident management teams coming from other parts of the country. The following chart displays 90th and 97th percentile thresholds of often used NFDRS (Fuel Model G) as well as CFFDRS indices for Voyageurs National Park.

Table 2 – Fire Index Thresholds for Voyageurs National Park

INDEX	FIRE DANGER RATING SYSTEM	90 TH PERCENTILE	97 TH PERCENTILE
Fire Weather Index (FWI)	CFFDRS	22	25
Buildup Index (BUI)	CFFDRS	58	84
Duff Moisture Code (DMC)	CFFDRS	44	67
Drought Code (DC)	CFFDRS	327	413
Burning Index (BI)	NFDRS (Fuel Model G)	45	54
Energy Release Component (ERC)	NFDRS (Fuel Model G)	34	41
Thousand Hour Fuel Moisture (1000 Hr.)	NFDRS (Fuel Model G)	17	15
Keetch-Byram Drought Index (KDBI)	NFDRS (Fuel Model G)	179	241
Hundred Hour Fuel Moisture (100 Hr.)	NFDRS (Fuel Model G)	13	11

- e. Step-up Staffing Plan – As fire danger increases, the park fire management organization's level of preparedness will increase. Preparedness actions that are defined by staffing classes tied to the Canadian fire weather index are contained in the park's Step-up Staffing Plan in Table 3. Each of the staffing classes in Table 3 is progressive and includes the previous actions.

Table 3 – Step-up Staffing Plan for Voyageurs National Park

STAFFING CLASS	ADJECTIVE RATING	FIRE WEATHER INDEX	ACTIONS TO BE TAKEN
I	Low	0 - 4	Normal preparedness operations
II	Moderate	5 - 12	Normal preparedness operations
III	High	13 - 20	<p>If previous day's lightning detection map shows positive strikes in/near the park, initiate one afternoon fixed-wing reconnaissance flight per day.</p> <p>If a high-visitation period, such as a holiday or special event, is determined to pose exceptional human-caused risk of wildland fires, automatically move to Staffing Class IV.</p>
IV	Very High	21 - 24	<p>Extend personnel (one ICT4 and 3 firefighters) work hours as necessary.</p> <p>All redcarded firefighters will carry fireline gear during work hours and have overnight gear available.</p>
VI	Extreme	25+	<p>One ICT4 and 3 firefighters on weekend standby. Extend personnel hours during normal work week as necessary.</p> <p>Initiate one afternoon fixed-wing reconnaissance flight per day.</p>

Note: Each of the above staffing classes is progressive and includes the previous actions.

3. Preattack Plan

The Voyageurs National Park preattack plan is considered a “work in progress,” that is, it is constantly being upgraded as staff time permits utilizing the suggested checklist from Reference Manual -18, chapter 7. Some preparations and procedures are established in the Annual Preparedness Activities section (C.2.c) of this plan. Currently, the preattack plan contains maps showing fire cache locations, and helispot locations. Other maps needed for preattack planning are located in other locations in the document as noted in Appendix G. Also located there is a fire danger “pocket card” which can be distributed to arriving firefighters who are not familiar with critical thresholds and fire danger conditions at Voyageurs. Due to the extensive water area of the park, transportation to fires is generally by boat or float plane so these routes are not marked, nor are water sources noted since they are obvious from the base map. (See Appendix G.) Voyageurs' nine fire caches are located at:

- Park headquarters (International Falls)
- Rainy Lake Visitor Center maintenance area
- Ludwig residence (Kawawia Island)
- Kettle Falls (Namakan side boathouse)
- Kettle Falls (Rainy side bait shed)
- Ash River Narrows (building at NPS gas dock)
- George Sprague's residence (Sand Point Lake)
- George Scott Seaplane Base (Crane Lake)
- Cajun Island

All remote fire caches will have one portable floating pump with fuel, a minimum of 500 feet of hose, nozzle, and miscellaneous handtools to outfit a 3 person Initial Attack crew until reinforcements arrive on scene. The above equipment is also located on two ranger patrol boats in the Rainy District and on four boats in the Namakan District. The Northeast Area Fire cache located at the Minnesota Interagency Fire Center (MIFC) in Grand Rapids, MN is available for backup.

4. Initial Attack

General Procedures: The Incident Commander will dispatch an initial attack/monitoring team to the fire and determine, in consultation with the Area Fire Management Officer or Chief Resource Management, if a fire is a wildland fire use or a unwanted wildland fire that must be suppressed. These forces will be equipped with all required personal protective equipment (PPE), i.e.: hard hats, gloves, 8" lace leather boots with lug soles, nomex shirts and trousers, and fire shelters. Personnel using portable pumps will wear eye protection. Personnel using chainsaws will wear eye protection, ear plugs and chaps. Initial attack forces will stay with the fire until it is declared out or they are relieved by the Incident Commander.

The cause of ignition of every fire will be determined, reported and properly archived using the Wildfire Cause Determination Handbook produced by the National Wildfire Coordinating Group (NWCG) as a guide. If the fire was caused by lightning, the decision-

making process will follow the procedures in the wildland fire use section of this plan (Section IV.B.2). If the fire, on the other hand, was human-caused, the decision-making process will proceed as follows.

The Incident Commander will be responsible for all actions taken on the fire from size-up to demobilization. His/her decisions will be accepted and his/her requests serviced as quickly as possible. After arriving on the fire, the Incident Commander will inform the Area Fire Management Officer of the size of the fire, rate of spread, fire potential, and personnel and equipment requirements. The Area Fire Management Officer may relieve or replace an Incident Commander on wildland fires for which s/he is responsible. As fire complexity increases, the initial attack Incident Commander will be replaced by a more qualified Incident Commander. Depending upon fire behavior and potential complexity, this second organization may be replaced by another Incident Commander and staff personnel following the guidelines in chapter 2, Extended Attack, pages 15 through 19 in the NWCG Fireline Handbook (NWCG PMS 410-1, 1998) or as subsequently revised.

- a. Initial attack priorities – Fires occurring in Prescribed Fire/Suppression FMU will normally receive the highest priority. In addition, fires occurring within 1/2 mile of the park boundary which have the potential to exit the park will also receive high priority. Elsewhere, fires will be prioritized based on potential threats to park resources.
- b. Criteria for initial attack Appropriate Management Response consistent with GMP/RMP objectives –
 - Public and firefighter safety
 - Protection of cultural, historic, and natural resources
 - Protection of improvements and private property
 - Minimum fireline construction
 - Available suppression resources and response times
 - Long and short term fire danger
- c. Confinement as an initial attack strategy – A confinement strategy may be selected for initial attack as long as it is not being used solely to meet resource management objectives. Resource benefits may be a side benefit but the strategy must be based upon the criteria listed above. A confinement strategy will follow the same management process as for wildland fire use decisions with a WFIP prepared in stages as the fire or management considerations dictate.

Confinement can also be a strategic selection through the Wildland Fire Situation Analysis (WFSa) process when the fire is expected to exceed initial attack capability or planned management capability.
- d. Response times – As noted above, access to fires by suppression forces is commonly by boat or float plane. Most parts of the park require 45 minutes to a hour to reach. Aircraft response times vary depending on the resource and the base

location. Water scooping CL215/CL415 aircraft from Ontario's Ministry of Natural Resources are generally the quickest response usually within minutes unless fire conditions in Canada preclude their use. MNICS air resources can usually respond within 45 minutes to 1 hour with helicopters, CL215s, heavy airtankers, single engine air tankers (SEAT's), and water dropping float planes. Additional ground resources are available through MNICS with response times running from 1-6 hours for extended attack resources and 12-24 hours for project fire support.

- e. Restrictions and special concerns by management area – Due to extensive water resources in the park, the following special restrictions will apply with regard to aerially applied retardant and foam use:

Retardant – No retardant drops within 400 feet of open water.

Foam (aerial delivery) – Aerial delivery of foam requires park Superintendent approval on a case-by-case basis. When approved, the following guidelines apply:

- Foam concentrate will only be injected into the holding tank after the water pick-up operation has been completed.
- Drops from Beaver, T2 & T3 helicopters – no drops within 200 feet of open water.
- Drops from Scoopers, heavy air tanker or heavy helicopter – no drops within 400 feet of open water.

Foam (ground delivery with motorized pumps):

- No application within 25 feet of open water when using small pumps (waterbug, Mk 26, Shindawa, etc.)
- No application within 50 feet of open water when using Mk III or equivalent pumps.
- All foam concentrate used for injection will be located in impermeable containment basins, i.e. visqueen (plastic sheet) spread over rocks or logs to form a catch basin.

Foam (ground delivery with backpack pumps):

- No application within 10 feet of open water.
- All backpack pumps will be filled minimum of 10 feet from open water. A separate, uncontaminated container must be used to transport water from source to backpack pump. This container must be kept uncontaminated by concentrate.

5. Extended Attack and Large Fire Suppression

There are wildland fires that cannot be controlled during the initial suppression response action or where the appropriate management response has not been successful. These may also be prescribed fires where the implemented prescription or actions are unsuccessful. The WFSA is initiated at this stage.

- a. Determining extended attack needs – If a fire threatens to exceed the initial attack capabilities of the park and local MNICS cooperating agencies, an Interagency Fire Management Overhead Team will be immediately requested by the Incident Commander, Area Fire Management Officer or Chief Resource Management through the Minnesota Interagency Fire Center Coordinator. The amount and type of assistance needed and requested will depend on the present and expected complexity of the fire situation, and be documented on a Resource Order Form (NFES-1470).
- b. Implementation plan requirements – WFSA development –Preparation of the WFSA for extended attack and large fire suppression should be done to evaluate suppression responses to wildland fires that have exceeded initial attack response or exceeded planned management capability. Enhanced resource benefits may be a side benefit of the planned action under the WFSA, but cannot be part of the objective of the action. Procedures for the WFSA process are outlined in the Wildland and Prescribed Fire Management Policy Implementation Guide.
- c. Complexity decision process from initial attack to extended attack – The Incident Commander will determine when the fire exceeds initial attack capability, and that additional resources need to be ordered. The following issues also need to be considered when evaluating the need for activation of an incident management team:
 - Is the park nearing depletion of Initial Attack (IA) resources?
 - What is the availability of additional resources within the state and nationally?
 - What is the fire burning in and what is the chance of holding it under current and predicted conditions?
 - What are the available air resources?
 - What is threatened – urban interface, special management areas, etc.?
 - What are the logistics issues of the incident – remote access, wilderness area, etc.?

The objective is to take the burden off the park when an incident exceeds local capabilities. Procedures for activation and implementation of a MNICS Type II Team are located in the MNICS Mobilization Guide.

- d. “Delegation of Authority” Letters for Incident Commander. Should fire activity and complexity warrant the ordering of an Incident Management Team as discussed above, a Delegation of Authority will signed by the Superintendent and incoming Incident Commander giving the team authority to manage the incident. Examples of Delegation of authority letters are found in Appendix E.5.

6. Exceeding Wildland Fire Implementation Plan

When wildland fires cannot be controlled during the initial suppression action or when the appropriate management response in a fire use area has not been successful, the WFIP is

considered to have been exceeded. The WFSA is initiated at this stage. Initiation of the WFSA is also necessary when implementation of a prescribed fire plan is not successful and the fire must be suppressed. The following parameters and considerations will be used in WFSA preparation at Voyageurs National Park:

Situations that could require selection of a new strategy through the WFSA include but are not limited to:

- Exceeding periodic assessment criteria, i.e. trigger points, air quality;
- Unacceptable risk to firefighter safety, natural or cultural resources, improvements;
- Fire leaving or threatening to leave MMA boundary or park boundary;
- Fire exceeds prescribed fire plan;
- Increasing demand on local and/or national fire management situation
- Agency administrator prerogative.

7. Minimum Impact Suppression Tactics (MIST)

Minimum impact suppression tactics are required policy for all fire management activities on National Park Service lands. Fire management activities within the park will be carried out in a manner that minimizes impacts to Voyageurs' natural and cultural resources. Fire camp facilities, when practical, will be located outside of the park's natural and historic zones. Of primary importance is the need to impart upon suppression forces a minimum impact fire suppression philosophy. Suppression forces will choose methods and equipment commensurate with suppression needs and the appropriate management response strategy which least alters the landscape or disturbs park natural and cultural resources. This policy is an attempt to take the national park ethic into account in firefighting practices; it is not a reason to relax normal safe firefighting practices. Some examples of minimum impact firefighting include:

- Use water instead of fire retardent chemicals in bombers.
- Cold trail the fire-edge when practical.
- Wetlines, or environmental lines, will be used wherever possible in lieu of handline construction if water and pumps are available. Waterbars will be constructed on handlines on steep slopes.
- Utilize soaker hose or foggers in mop-up. Avoid "boring" and hydraulic action on shallow soils.
- Firelines will be kept to the minimum width necessary to allow backfiring or safe blackline to be created. Utilize natural barriers wherever possible to avoid "tunnel effect."
- If a mineral soil line is needed, utilize fireline explosives whenever possible instead of heavy equipment. As a general rule, heavy equipment will not be used in the park and only used in the most worst case scenario and with the written approval of the Superintendent.
- Decisions on suppression practices will be made by the Incident Commander. Utilize his/her creativity.

- Minimize tree falling. If necessary to fall trees in visually sensitive areas (i.e., trails, portages, lakeshores), utilize "slant cut" technique to face cut away from view, or re-cut later during rehabilitation activities.
- Archeological sites will be identified prior to a fire and protected wherever possible. Minimize ground disturbance to protect cultural resources.
- Scatter or remove debris as prescribed by the Incident Commander.
- All firelines, spike camps, or other disturbance in visually sensitive areas will be rehabilitated to maintain a natural appearance.
- After the fire emergency is over, transport of personnel, equipment, and trash out of the park will be consistent with national park resource management objectives.

8. Rehabilitation Procedures

Rehabilitation will only be required where the impacts of the fire itself or of the associated suppression actions are significant and can be mitigated. In no case will action be taken in the name of rehabilitation which further compounds the situation. If the minimum impact suppression actions outlined above are used, then only minimal rehabilitation will be necessary. The location of lines to avoid the need for falling and bucking of trees, use of wet lines and foam, use of streams and other firebreaks, all contribute toward that goal. Park management will play an active role in suppression actions to see that this happens. The Delegation of Authority to Incident Commanders and the Wildland Fire Situation Analysis are key facets in this process.

Burned areas will generally not be seeded. Residual seed and sprouting from surviving rootstalks will provide natural re-vegetation. That is far superior to any introductions from even "native" seeds. Seed-bearing materials cut alongside the line can be scattered as a mulch that guarantees indigenous seed. It has been proven that seeding of exotic, aggressive annual grasses depletes critical soil moisture and may actually deter or delay recovery of the native vegetative cover.

Some burned areas, however, will need to be seeded or planted to increase the proportion of pine in an area's post-burn forest. Although residual seed and sprouting from surviving rootstalks will provide natural re-vegetation for most species, seeding or planting of red, white and jack pine may be needed to compensate for loss of seed trees to pre-park forest management practices.

Rehabilitation of firelines and other work to control erosion possibilities will commence as soon as possible, even before the fire may be declared out. This is especially important if existing equipment and personnel still on the fireline are not being fully utilized in mop-up operations.

9. Records and Reports

- a. Wildland Fire Implementation Plan (WFIP) – A WFIP will be prepared for every wildland fire. *Responsibility: Area FMO.*
- b. Individual Fire Report (D1-1202) – The basic report for documenting every wildland fire (procedures are found in RM-18). *Responsibility: Area FMO.*

- b. Fire Experience and Qualifications – The Wildland Fire Management Computer System at NIFC is the central repository for all individual fire experience and training records. *Responsibility: Area FMO.*
- c. Daily Situation Reports – Required to be transmitted to Mn. Interagency Fire Center (MIFC) daily by 1000 hours. *Responsibility: Fire Program Assistant.*
- d. Resource Order Form, NFES 1470 – All assistance requests must be documented on the Resource Order Form. These forms are designed to be transmitted verbally over the phone or copies may be faxed. The order form is, in essence, and obligating procurement document. *Responsibility: Fire Program Assistant.*
- e. Daily Weather Records – Daily fire weather records from Voyageurs National Parks’ permanent and temporary fire weather stations will be entered into WIIMS by 1400 local time each day. *Responsibility: Fire Program Assistant.*
- f. Year-end Accomplishment – *Responsibility: Area FMO.*

SECTION V. FUELS MANAGEMENT

Specific information for hazardous fuel treatment including timing, sequence, specific location, interagency project planning and local agreements is part of the hazardous fuel plan (Hazard Reduction Plan) located in Appendix H.

A. Scope of Fuels Management Program

The fuels management program at Voyageurs National Park utilizes prescribed fire and mechanical treatment applications for treatment of hazardous fuels for wildland fire mitigation and ecosystem management. The Voyageurs Interim Resource Management Plan (RMP) states that: “Fire is used as a tool to achieve resource management objectives, including but not limited to sustaining a healthy, natural ecosystem in fire-dependent vegetation types; controlling invasive and exotic species; reducing fire risk; restoring or reducing selected vegetation communities; maintaining vistas; and preparing seed beds.” It proposes to do this through the following strategies:

- Use wildland fire and prescribed fire to achieve established management objectives.
- Mimic natural fire regimes to the greatest extent possible without unduly reducing visitation or visitor enjoyment.
- Coordinate with adjoining land management agencies on multi-jurisdictional large-scale burns.

B. Prescribed Fire

1. Annual Prescribed fire Program

Prescribed fire will be used each year in Voyageurs' fire management units to achieve resource management objectives established in the Interim Resource Management Plan. Voyageurs' annual prescribed fire program will be prepared by the Fire Management Staff, Natural and Cultural Resource Management Staff, and assistance from the Ecoregional Fire Ecologist. This program will consist of a review of prescribed fires completed for the current year and those proposed for the following fiscal year. Priorities for use of prescribed fire are determined by the length of time since previous burn, current fuel loading and vegetative conditions, topographic advantage, and by personnel and logistical requirements. The five year burn proposal (Appendix H) will provide the guidance for yearly priorities. Units to be burned will be identified by July of the year prior to implementation and burn proposals and funding requests entered into the Shared Applications Computer System (SACS) no later than July 27th for the next fiscal year.

The Area Fire Management Officer or designee Burn Boss with the input of Natural and Cultural Resource Management staff will develop unit specific burn plans for each proposed unit. Guidance for burn plan development is found in Chapter 10 of Reference Manual 18. The Burn Boss writing the plan will conduct a field reconnaissance of the proposed burn site with members of the Fire Management Team to discuss special problems, conditions, objectives, and firing techniques. At the completion of the reconnaissance, the Prescribed Burn Boss will prepare a prescribed fire plan.

Voyageurs National Park's Interim RMP has an established target vegetation condition which calls for an increase in the acreage burned annually. This increase will be necessary to meet two objectives of the target condition: increase the red and white pine component and maintain the jack pine component which due to its even-aged condition, will begin to rapidly succeed to other non-fire dependent species.

2. Prescribed Fire Strategy for Fire Management Units

Park fire management personnel propose to conduct prescribed fires on a total of 21 distinct burn units from 2002 through 2006, encompassing 6,108 acres in total (approximately 5 percent of the total land area in the park). Thirteen additional alternate units including 5 re-entry fire applications (re-entry units are those which require multiple burn treatments to meet objectives) and 8 new units, totaling 6,094 acres are also identified to potentially be burned between 2002 through 2006 although not scheduled in the 5-year burn plan. Alternate units may be burned in a particular year(s) should burning conditions for that year(s) permit additional accomplishments. (See Appendix H, Long-Term Prescribed Fire and Hazard Reduction Plan, for a map depicting location and burn schedule and a brief description of each unit).

- a. Wildland Fire Use FMU – Prescribed fires are used in this FMU to accomplish vegetation management objectives, such as encouraging pine regeneration or creating wildlife habitat and fuel hazard reduction objectives, such as removing fuel ladders and downed woody debris from the sub-canopy of red and white pine stands.
- b. Prescribed Fire/Suppression FMU – A prescribed fire program is utilized within this FMU to accomplish vegetation management objectives, such as encouraging pine regeneration or improving wildlife habitat and fuel hazard reduction objectives, such as removing fuel ladders and downed woody debris from the sub-canopy of red and white pine stands. To the maximum extent possible, this program tries to simulate the effects of the natural fire regime on the plant and animal communities with unit boundaries. The objective of this program is to simulate the severity and intensity of natural fires at times and places when safety and control can be assured.

3. Prescribed Fire Qualifications Needs

The Area Fire Management Officer will designate, with approval by the Superintendent, a qualified Prescribed Burn Boss/Incident Commander who will be responsible for all aspects of the burn. Using the Incident Command System format, s/he will also designate Operations, Plans, Logistics, and Finance Section Chiefs, Safety Officer, Public Information Officer, and other Burn Team members as appropriate. Qualified Prescribed Burn Bosses, Section Chiefs, Ignition Specialists, holding forces, and Fire Monitors, etc. will be selected from a list of those certified by the Area Fire Management Officer. An effort will be made to develop a highly trained cadre of individuals within each division that will provide the nucleus of the Burn Team and insure professional execution of the program. In order to allow for attendance at winter and spring fire training programs and to provide continuity, permanent and permanent-less-than-full-time personnel will be given preferential treatment for training over seasonal employees.

In order to effectively write prescribed fire plans and institute a prescribed fire program at Voyageurs National Park, the minimum staffing needed within the park is 1-2 Prescribed Burn Boss IIs, and 2-4 Fire Effects Monitors. Other holding and ignition resources can be pooled from other park operations or outside the park. It is estimated that in order to meet the objectives of the Target Condition listed in the RMP, the park will need at a minimum, 1 Burn Boss I, 1 Burn Boss II and 4 Fire Effects Monitors.

Voyageurs National Park prescribed fire operations normally require assistance in the form of holding and lighting resources from outside the park. These are procured through MIFC dispatch from the other MNICS agencies on a case-by-case basis.

4. Prescribed Fire Monitoring

All prescribed fires will be monitored. Information gathered during fire monitoring is needed to: keep fires within predetermined criteria, know when to take suppression action, protect human life and/or property, and increase knowledge of fire effects on the park

ecosystem. A fire monitoring team will observe the fire, assess its potential and provide a historical record. Monitoring will include documenting the fire environment (weather, fuels, topography), fire behavior (manner and rate of spread, flame length, etc.), and fire effects (percent of fuels consumed, changes in plant and animal community composition and structure, etc.). Photographs may be taken. Weather readings will be made periodically with a belt weather kit at the fire site. Forms for recording data will be supplied to monitors.

The National Park Service Fire Monitoring Handbook (U.S. NPS 2001) will be adopted to monitor fire weather, behavior and effects in Voyageurs. It describes in detail all aspects of a comprehensive, state-of-the-art monitoring program. The Voyageurs National Park Fire Monitoring Plan is an appendix to this fire plan. It defines for the park: fire monitoring goals and objectives; monitoring types, minimum qualification standards for fire monitors; and monitoring levels and minimum acceptable standards for documenting fire weather, behavior and effects.

5. Prescribed fire Critiques

The Fire Management Team will critique each prescribed fire in the park to determine the effectiveness of the prescribed fire program. A report of the results of the critique will be prepared and submitted to the Superintendent for review. Reference Manual 18, chapter 10 provides a "Post-Project Evaluation" template for each project. A post-season critique and review of the monitoring data of all prescribed fires in the park during the year by the Fire Management Overhead Team will determine if objectives were met. (See also Section XII).

6. Reporting and Documentation

Each prescribed fire within Voyageurs will have all the Fire Monitoring Forms completed by the Fire Monitoring Team prior to, during, and after the fire, archived in the park's fire records.

The Prescribed Burn Boss will prepare a final report on the burn for the Area Fire Management Officer, including at least the total work-hours and burn costs, a summary of the burn chronology, complete weather and prescription records, and a map of the actual burn perimeter. Other data may be requested by the Chief Resource Management. The Area Fire Management Officer will then complete all necessary fire reports, forward the reports to the regional office, and keep all fire related records for future use in planning and evaluating prescribed fire operations.

7. Historic Fuel Treatment Map

The ongoing fuel treatment map for Voyageurs National Park is maintained in the park "Fire Atlas" as well as in GIS coverage as part of the park's Fire History Map in order to display the totality of fire disturbance to the park's ecosystem.

C. Prescribed Fire Burn Plan

Burn plans will be completed using a format consistent with the direction found in RM-18, Chapter 10.

D. Exceeding Existing Prescribed Fire Burn Plan

Prescribed fires exceeding the parameters of the plan will be suppressed. A WFSA will be initiated under the provisions found in RM-18, Chapter 9.

Fire suppression actions will be the same as described in the fire Suppression section of this FMP (Section VI.C.5). Refer to the Contingency Plan section of the Prescribed Fire Burn Plan if further information is needed to complete the WFSA.

E. Air Quality and Smoke Management

1. Pertinent Air Quality Issues

Voyageurs is one of 48 units of the National Park System designated as a mandatory Class 1 air basin. These areas are afforded the greatest degree of air quality protection under the Clear Air Act, and the NPS is required to do all it can to ensure that air quality related values (including flora, fauna, soil, water, visibility, historic structures, etc.) are not adversely affected by air pollutants. To achieve this end, NPS personnel review any permit applications for industrial or other facilities that may contribute to the deterioration of the airshed.

- a. Visibility – Visibility is considered “good” in the park, but is decreasing. An analysis of visual range for the period 1988-1993 found a downward trend in visibility, especially on the haziest days (ARD, 1999).

Analysis of “air mass back trajectories” indicates air masses originating at times quite far to the south of Voyageurs were often associated with poor visibility conditions at the park (Gebhart and Malm, 1991). These sources are hard to pinpoint and even harder to regulate. Because aerosols travel hundreds, even thousands, of miles, some sources of impact to the park’s visibility are largely out of Voyageurs’ and even the state’s regulatory influence.

- b. Particulates – Pulp mills, including those in the Fort Frances/International Falls area, are producers of all three types of measured particulates--large particulates, which settle as dust, inhalable particulates (PM 10), and fine particulates (PM 2.5) (Ontario Ministry of the Environment, 1998). All three particulates contribute to regional haze.

It should be noted that the pulp mills are only one of many sources of particulates. Other sources likely include emissions from mobile and stationary sources in urban areas upwind of the park, coal-fire power plants, taconite mines and processing plants, and smelters (ARD 1999). While emissions from wildland fire smoke have not been a major contributor to regional haze, occasional episodes occur when northwest wind patterns transport smoke from large wildland fires from Ontario and Manitoba. These episodes are normally quite infrequent and of short duration.

2. Program of Action

- a. Location of Class I Airsheds – In addition to Voyageurs, the other mandated Class I Airshed in close proximity to the park is the Boundary Waters Canoe Area Wilderness (BWCAW) administered by the Superior National Forest. It is located two miles to the southeast of Voyageurs. The Superior NF has both a wildland fire use program and a prescribed fire program in the BWCAW. Voyageurs National Park will coordinate with the Forest on scheduling of burns to ensure that excessive smoke impacts don't occur to either airshed.
- b. Smoke-Sensitive Areas – The following areas are in close proximity to the park and have the potential to be impacted by smoke from prescribed fires and WFU fires. The park will make every attempt to mitigate the negative impacts of smoke by following the procedures in the draft Minnesota Smoke Management Plan (see below) and Best Available Control Measures (BACM) as described by the U.S. Environmental Protection Agency (EPA. 1992).
 1. Crane Lake
 2. Ash River Resort Community
 3. Kabetogama Resort Community
 4. Island View Area
 5. International Falls/ Fort Francis ON
- c. Local and Regional smoke management restrictions and procedures – The MNICS Agencies (see Section VI.E.) along with the Minnesota Pollution Control Agency (MPCA), have developed a draft Smoke Management Plan for Minnesota which describes the procedures for managing smoke emissions from prescribed fires in the State. (The Draft Minnesota SMP is a non-attached appendix to this plan. When the final SMP is approved, it will become part of this FMP.) Voyageurs National Park will comply with all procedures in the draft SMP. There may be times when the park determines that stronger requirements are necessary. These requirements will be part of the air quality mitigation of the individual prescribed fire burn plan to which it pertains.

F. Non-Fire Applications

1. Mechanical Treatments

Mechanical fuel treatment methods are regularly used for hazardous fuel reduction in areas where safe and effective prescribed fire treatment is precluded by fuel loads or is otherwise unfeasible.

- a. Annual preparedness activities – Chainsaw training will be accomplished to ensure all chainsaw operators are qualified for the work they will be doing.

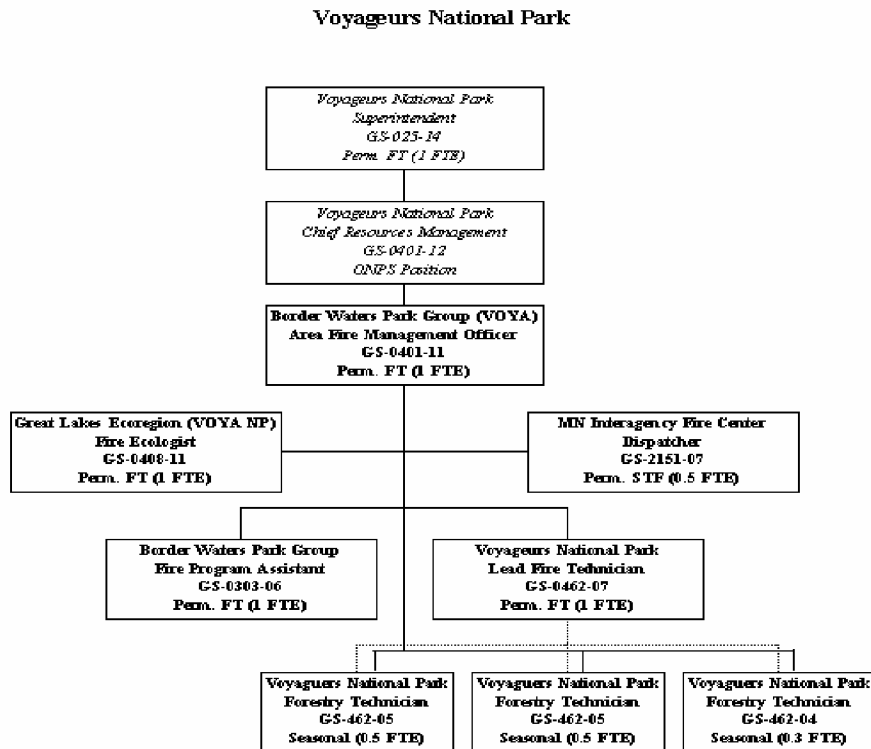
- b. Equipment use restrictions – Equipment use for non-fire applications is limited to hand operated power equipment. No tracked or wheeled power equipment will be used.
- c. Effects monitoring – Due to the low-impact nature of the mechanical treatments to be utilized at Voyageurs National Park, monitoring effects will be primarily visual assessment of the success of the project in reducing the fuel hazard. Before and after photographs and dead-and-downed fuels transects (Brown's lines) will be used to document the effects and measure success.
- d. Critiques – Critiques of the mechanical treatment projects will occur as part of the annual fire management review process (see Section XII.).
- e. Cost Accounting – The Area FMO will maintain cost records for all mechanical treatment projects. In many cases, treatment costs will be cost shared by the use of in-house preparedness resources during lower staffing level days.
- f. Documentation – All mechanical treatment projects will be documented using requirements found in RM-18, Chapter 10.C. In addition, project compliance will be documented on the Voyageurs Environmental Screening Form with minimal tool analysis
- g. Annual planned project list – Currently ongoing projects: Kettle Falls Hotel fuel reduction project. Planned projects: Fuels reduction around all park improvements and inholdings.

SECTION VI. FIRE MANAGEMENT ORGANIZATION AND RESPONSIBILITIES

This section discusses the responsibility, by specific park staff positions, for implementation of the fire management program and clearly defines the areas of responsibility, provides clear direction and accountability, and furthers the development of a responsive fire management program.

A. Voyageurs National Park Fire Management Organization

Figure 5 – Fire Management Organization Chart for Voyageurs National Park



FIRE MANAGEMENT RESPONSIBILITIES

SUPERINTENDENT:

As the Agency Administrator, the Superintendent is responsible for implementation of all fire management activities within the park, ensures compliance with Department of Interior, National Park Service, and Voyageurs National Park policies. She/He has overall responsibility for development and implementation of the Park's fire management program. Is responsible for periodic assessment signature to certify the continued management of wildland fire use actions is acceptable. This responsibility may be delegated in the Superintendent's absence to someone at the Division Chief level or above in the park.

CHIEF OF RESOURCE MANAGEMENT:

Has overall supervisory responsibility for all park-related fire management activities. The Chief of Resource Management reviews and advises the Superintendent on requests for fire emergency assistance, operational activities required for the implementation of the Fire Management Plan, and completeness and correctness of all final fire reports. She/He designates staff personnel to assist the Area FMO with implementation of the Fire Management Plan. She/He reviews fire management related implementation plans such as burn plans or mechanical fuels treatment plans.

Resource Management staff develop resource management objectives involving fire's role in the ecosystem; work closely with the Area FMO and Fire Ecologist to identify priorities for the use of fire as a management tool, including planning, compliance, mitigation, and rehabilitation standards if indicated.

AREA FIRE MANAGEMENT OFFICER (FMO)/FIRE MANAGEMENT STAFF:

Responsible for implementation of Fire Management Plan. This responsibility includes coordination and supervision of all prevention, preparedness, detection, wildland fire, prescribed fire, suppression, monitoring, and post-fire activities involving NPS lands. Area FMO prepares an annual report detailing fire occurrences and prescribed fire activities undertaken in each calendar year, coordinates the implementation of this Fire Management Plan with other governmental agencies administering adjacent lands and with local landowners, and develops and implements cooperative fire management agreements with other federal, state, Canadian, and local agencies. The annual report will serve as a post-year's fire management activities review, as well as provide documentation for development of a comprehensive fire history record for the Park. The FMO submits budget requests and monitors FIREPRO funds allocated to Voyageurs National Park.

The Area FMO prepares, in consultation with park Resource Management Specialists, prepares implementation plans for prescribed fires, wildland fire use fires, and mechanical fuels treatments and/or designates a Burn Boss/Fire Use Manager to implement the plan. She/He is responsible for preparation of all required fire reports and reporting. The Area FMO maintains records for all personnel involved in suppression and prescribed fire activities, detailing the individual's qualifications and certifications for such activities and updates all fire qualifications

for entry into the NPS Shared Applications Computer System (SACS). The Area FMO nominates personnel to receive fire-related training as appropriate.

She/He designates the person to serve as Incident Commander (IC) for initial/extended attack purposes. The Area FMO may assume the position of IC or designate other personnel to take over that position. Decisions relating to requests for overhead or additional firefighting personnel and equipment, as well as decisions related to appropriate management responses to wildland fire will be made by the Area FMO in consultation with the Superintendent and/or Chief Resource Management.

CHIEF OF VISITOR EDUCATION/PLANNING AND STAFF:

Serves as the park's Public Information Officer. Responsible for contacting the public, drafting notices and press releases, and distributing information about fire ecology and the park's fire management program.

Chief of Visitor Education/Planning is responsible for incorporating wildland fire principles and fire ecology in public contact messages and interpretive programs. The Division provides basic fire program information to park staff and visitors as part of the park information packages and ensures that accurate information is incorporated into park books, brochures and exhibits. Provides red-carded firefighters as available to support fire management.

CULTURAL RESOURCE MANAGEMENT SPECIALISTS:

Serves as a resource advisor in support of implementation of the Fire Management Plan. Reviews fire management related implementation plans such as burn plans or mechanical fuels treatment plans and completes cultural resource compliance as needed. Serves as a resource advisor on park fires, including prescribed fires, wildland fire use fires, and unwanted wildland fires to insure protection of cultural resources. Identifies role of prescribed fire in furthering cultural resource objectives as appropriate for cultural landscape preservation and protection of historic structures.

ADMINISTRATIVE OFFICER AND STAFF:

Supports the park's Fire Management Program by providing services in personnel, budget, procurement, contracting, and computer support. Provides red-carded firefighters as available to support fire management.

CHIEF OF MAINTENANCE:

Maintenance may assist with patrolling Lakeshore by vehicle, boat, and on foot. Report location of fires. Red-carded individuals will be used on initial attack. Provides preventive maintenance and repairs to park fire equipment as needed. Provides red-carded firefighters as available to support fire management.

CHIEF VISITOR SERVICE AND RESOURCE PROTECTION AND STAFF:

Has overall supervisory responsibility for all park-related emergency operations, including integration of fire management activities with other emergency operations. Responsible for implementing fire related closures such as trail closures during fire operations or campfire restrictions during periods of high fire danger. As the park's Aviation Officer, works with the

Area FMO on fire related aviation issues. Designates staff personnel to assist the Area FMO with implementation of the Fire Management Plan. Provides red-carded firefighters as available to support fire management.

GREAT LAKES ECOREGIONAL FIRE ECOLOGIST:

Assists park resource management specialists and Area FMO develop resource management objectives involving fire's role in the ecosystem. Works closely with the Area FMO to identify priorities for the use of fire as a management tool, including planning, compliance, mitigation, and rehabilitation standards if indicated. Coordinates fire effects monitoring activities and data analysis within the park and makes recommendations regarding fire effects to the Area FMO.

B. FIREPRO Funding

Voyageurs National Park FIREPRO submissions are updated annually per requirements in RM-18, Chapter 17. The current submission is located in Appendix E. While the current funding is based on the last five years of data, it is anticipated that in order to meet the target condition for vegetation management in Voyageurs National Park, this funding will need to increase to build a prescribed fire organization which can carry out an accelerated burn program.

C. Relationship of Fire Management Organization to Voyageurs National Park's Organizational Structure

At Voyageurs National Park the Fire Management Organization is recognized as a critical and fully- functioning part of the park's natural resources program as reflected by its location in the Resource Management section of the park organization. This reflects the understanding that Fire Management's role is one not only of resource protection, but one of ecosystem management as well.

D. Periodic Assessment of Fire Use Actions

The park Superintendent is responsible to periodically assess and certify by signature that continued management of wildland fire use actions is acceptable. The park Superintendent under certain conditions may delegate this responsibility to another organizational level.

E. Interagency Coordination

Voyageurs National Park is actively involved and committed to cooperative agreements and interagency coordination to ensure the fire management program is implemented in a timely, safe, cost efficient and professional manner. The primary vehicle for interagency cooperation is Voyageurs National Park's active membership in the Minnesota Incident Command System (MNICS). MNICS is made up of representatives from the Minnesota Department of Natural Resources (MNDNR), Minnesota Department of Emergency Management (MNDEM), Bureau of Indian Affairs (BIA), U.S. Fish and Wildlife Service (USFWS), U.S. Forest Service (USFS) as well as the National Park Service Units in Minnesota. Its purpose is to work towards common goals in cooperative fire suppression and fire management including prescribed fire.

Voyageurs National Park also maintains a very important interagency relationship with the Ontario (Canada) Ministry of Natural Resources (OMNR), Ft. Frances District. A shared international boundary requires mutual aid fire suppression for the border area as well as the sharing of intelligence and information about fire situations, closures, restrictions and fire potential.

F. Interagency Contacts

The source for all MNICS contacts is the MNICS Mobilization Plan which is a non-attached appendix of this plan. Additional contacts for OMNR, Cooperating Volunteer Fire Departments, local MNDNR offices, National Weather Service, and local law enforcement are found in the phone listing in Appendix E.1.

G. Agreements

Table 4 below displays Voyageurs National Park's current agreements. Copies of the agreements are located in Appendix E.3.

Table 4 – Voyageurs National Park's Current Wildland Fire-Related Agreements

With Whom	Title of Agreement	Summary
MNICS Partners	MNICS Charter	Member Organization to operate under NIIMS (ICS)- Parent agreement for MNICS
MNICS Partners	Implementation Plan	Implementation plan for the Interagency Coordination Center
MNICS Partners	Interagency agreement for MIFC	Authorizes MIFC Operations
MNICS Partners	MIFC Operating Plan	Operating plan for MIFC Dispatch & financial plan
MNICS Partners	MOU for RX Fire	Authorizes cooperation on RX fire
National Park Service & Minnesota DNR	Agreement between DNR and NPS for shared protection responsibilities	Sharing initial attack resources and boundary fires between each NPS unit in MN and the DNR. How and when to bill each other.
Ontario Ministry of Natural Resources, USFS, NPS, MNDNR	Border Waters Agreement	Sharing fire fighting resources between US and Ontario
Voyageurs National Park & BIA	Mutual Aid Wildland Fire Protection	Agreement for Indian Trust Land within the park
Voyageurs National Park & Kabetogama VFD	MOU between Voyageurs National Park and Kab. VFD	Agreement to provide personnel and equipment for structural and wildland fire.

SECTION VII. FIRE RESEARCH

A. Previous and Ongoing Research

There has been and is currently extensive research conducted at Voyageurs National Park, including research relating to forest ecology. There only research directly related to fire ecology currently underway is to assess the impacts of forest fires on levels of mercury in lake and forest environments. This research was proposed by the USGS Biological Resources Division (BRD) and is jointly supported by Voyageurs National Park, the Minnesota Pollution Control Agency, and the USGS BRD International Falls Biological Station. The primary contact is Laurel Woodruff.

Some previous research relating more or less directly to fire ecology and fire regimes is listed below:

Allen, B.; Sales, J.; Meysembourg, P.; Bonde, J. and Johnston, C. 1993. Effects of past disturbances on present-day forests at Voyageurs National Park. Page 63 in ACR/INFO Maps 1992. Redlands, CA: Environmental Systems Research Institute.

Coffman, M.S.; Rakestraw, L. and Ferris, J.E. 1980. The fire and logging history of Voyageurs National Park. Final Report National Park Ice tract No. CX-6000-7-R054. Houghton, Michigan: Michigan Technological University.

Crowley, C.F. 1995. Patterns of temporal and spatial change in the vegetation of Voyageurs National Park. Masters Thesis. Minneapolis/St. Paul, Minnesota: University of Minnesota.

Fritz, D.L. 1986. Special history study on logging and lumbering as associated with the area now incorporated within the present boundaries of Voyageurs National Park. NPS D-44. Denver, Colorado: U.S. National Park Service.

Hop, K.; Faber-Langendoen, D.; Lew-Smith, M.; Aaseng, N. and Lubinski, S. 2001. USGS-NPS vegetation mapping program, Voyageurs National Park, Minnesota, project report. Wisconsin: US Department of the Interior, Geological Survey, Upper Midwest Environmental Sciences Center.

Jakala, S.G. 1994. Fire occurrence and return interval at Voyageurs National Park, Minnesota. Unpublished Report. Voyageurs National Park: Resource Management Files.

Jakala, S. G. 1993. Preliminary results of underburning for fire hazard reduction in the southern boreal transition forest of Voyageurs National Park, Minnesota. Missoula, MT: Fire in Wilderness and Park Management. Proceedings of the Symposium, March 30 – April 1, 1993.

Kurmis, V.; Merriam, L.C.; Aaseng, N and Webb, S. 1980. Primary plant communities Voyageurs National Park. Report No. 3. Minneapolis/St. Paul: University of Minnesota.

Kurmis, V.; Merriam, L.C.; Aaseng, N and Webb, S. 1979. Primary plant communities Voyageurs National Park. Report No. 2. Minneapolis/St. Paul: University of Minnesota.

Kurmis, V.; Merriam, L.C.; Aaseng, N and Webb, S. 1978. Primary plant communities Voyageurs National Park. Report No. 1. Minneapolis/St. Paul: University of Minnesota.

Western Great Lakes Global Change Research Program. 1998. Holocene paleoenvironments in Western Great Lakes parks. Columbia, MO: USGS Biological Resources Division, Northern Prairie Wildlife Research Center, Missouri Field Station.

B. Research Needed to Implement or Refine Fire Management Program

An overriding research need revolves around the potential for major fire regime changes due to global climate change and the hypothesis that the border lakes region will be more severely impacted by global warming due to its distance from the moderating influences of the world's oceans (Pastor, 2001).

Other needed fire research has been determined based on the target condition established for selected vegetation community types (SVCT) at Voyageurs. Fire-related research needs are:

1. Northern Hardwood Shrub Swamp SVCT:
 - Effects of repeated fire, including fire effects monitoring plots
 - Effects of burning on moose habitat
 - Optimum time of year for burning
 - Historic range of natural variability of fire regime
 - Optimum frequency at which this type should be burned
 - What are physiological signs that it is time to burn?
2. Spruce-Fir-Aspen Forest SVCT
 - Historic range of variability of fire regime and stand age structure and composition
 - Effects of fire, especially effects of varying fire severity and season of burn
 - Can white pine succeed naturally without fire?
 - Can fire be used without damaging residual pine?
 - Non-fire tools to convert stands to pine.
3. Aspen-Birch/Boreal Conifer Forest SVCT
 - Historic range of variability of the fire interval
 - Historic range of variability of the distribution of seral stages of this SVCT across the landscape
 - Need for a stand age-class distribution map
4. Red and White Pine Forest SVCT
 - Better presettlement fire history

- Historic range of variability of canopy and age structure of pine stands in the park
 - Are large scale wind events such as the 1999 blowdown increasing?
5. Jack Pine / Balsam Fir Forest SVCT
- Historic range of variability of fire disturbance and age structure in jack pine
 - Safe and effective fire prescriptions for regenerating jack pine which was dependent of high intensity stand replacing fires
 - Stand origin mapping or time since disturbance map to determine which stands are at highest risk of succession to other types.
6. Treed Rock Barrens SVCT
- What was the historic role of fire in these communities?
 - What are the effects of fire exclusion?
 - What are the effects of fire and fire exclusion to lichen communities found in this type?

SECTION VIII. MONITORING

A. Short and Long-Term Monitoring

All wildland fires and prescribed fires, as well as wildland fire use fires, will be monitored. Information gathered during fire monitoring is needed to: keep fires within predetermined criteria, know when to take suppression action, and protect human life and/or property. A fire monitoring team will observe the fire, assess its potential and provide a historical record. Monitoring will include documenting the fire environment (weather, fuels, topography), fire behavior (manner and rate of spread, flame length, etc.), and fire effects (percent of fuels consumed, changes in plant and animal community composition and structure, etc.). Photographs will be taken. Weather readings will be made periodically with a belt weather kit at the fire site. Forms for recording data will be supplied to monitors.

Fire weather will be collected every day at 1400 hours (local time) at the Kabetogama Volunteer Fire Department permanent remote automated weather station from April 1 through November 1. Daily fire weather records from Voyageurs' permanent and temporary fire weather stations will be entered into the Weather Information Management System (WIMS) by 1400 hours each day by the Fire Program Assistant. The Kabetogama weather station readings will provide the daily information required to calculate the prescribed indices under the Canadian Forest Fire Danger Rating System (CFFDRS), and fire behavior parameters under the Canadian Fire Behavior Prediction (FBP) system. All data entered directly into WIMS will be automatically archived on the National Fire Weather Data Library (Bradshaw and Fischer 1984). The resultant time series data base of fire weather provides management a powerful foundation to assess the significance of current fire danger in comparison to historic trends and fire occurrence data using FIREFAMILY PLUS software. Additional general weather information will be obtained from the National

Weather Service (NWS) weather station at the Falls International Airport. Fire weather forecasts will be obtained from the NWS office in Duluth.

In addition, fire weather for prescribed fires will be recorded by the Prescribed Burn Boss or a designee at least 14 days, and preferably 30 days, prior to the earliest ignition date of the burn. When possible, a portable, temporary weather station will be established for each prescribed fire so that CFFDRS indices can stabilize before the burn. The station will be positioned, and readings will be taken in such a way as to reflect the average peak burning period conditions within the most flammable fuel type in the unit, as well as 24 hour variations. Fire danger indices from these portable stations will be calculated using the weather station software (Fire Weather Plus or WeatherPro).

Voyageurs National Park operates an Air Quality Monitoring station located near Sullivan Bay in the Ash River area of the park. Located at the station is an Interagency Monitoring Protected Visual Environments (IMPROVE) station and a National Atmospheric Deposition Program (NADP) station. This instrumentation monitors and documents carbon monoxide, nitrogen dioxide, sulfur dioxide, lead, ozone, and particulate matter levels as well as acid precipitation deposition at the NADP site. Data from this station is not "real time" information, but should it become necessary, data could be compared with wildland fire or prescribed fire events to document any impacts on air quality.

The Minnesota Smoke Management Plan provides for recording nuisance complaints and acres burned, but it lacks a quantitative and qualitative monitoring program for evaluation. Criteria to evaluate data from existing network monitoring stations from IMPROVE and portable monitoring sites is needed as the Minnesota Smoke Management Plan evolves. This evaluation should be available to managers and decision-makers prior to igniting prescribed fires, determining whether to allow wildland fire for resource benefits, and monitoring on-going wildland fires. In addition, this evaluation should provide "real time" monitoring with portable monitors as fires are burning to be time sensitive. While the federal guidance does not specify what type of instrumentation to use in monitoring fires, a standard protocol is necessary. The Superior National Forest is using portable Datarams to monitor PM 2.5 and PM 10 from both wildland use fires and prescribed fires. Voyageurs National Park will investigate the possibility of using portable PM 2.5 and PM 10 to monitor these types of fires in the future.

B. The Fire Monitoring Handbook

This handbook, developed by the National Park Service (U.S. NPS, 2001) outlines protocols for monitoring fire weather, behavior and effects, and describes in detail all aspects of a comprehensive, state-of-the-art monitoring program. These protocols have been adopted at Voyageurs National Park.

C. Fire Monitoring Plan

The Voyageurs Fire Monitoring Plan is an appendix to this fire plan. It defines for the park: fire monitoring goals and objectives; minimum qualification standards for fire monitors; and monitoring levels and minimum acceptable standards for documenting fire weather, behavior and

effects. Monitoring protocols adhere to those described in the Fire Monitoring Handbook (U.S. NPS, 2001). In brief, fire effects monitoring in the park consists of sampling permanent vegetation plots, which includes measurements of canopy and pole-size trees, ground cover, dead and down fuels, and duff, and taking photographs. Plots are sampled pre-burn, immediately post-burn, and one, two, five, and ten years post-burn. Annual fire effects monitoring information is provided to resource management staff to provide feedback on the success of fire use with respect to meeting park vegetation management goals and to approaching the desired future condition of park vegetation. The Fire Monitoring Plan for Voyageurs National Park is located in Appendix F.

SECTION IX. PUBLIC SAFETY

Fire can be hazardous and must be given very high priority during certain conditions. A Safety Officer will be assigned to all large wildland fires, wildland fire use fires, and all prescribed fires. Employees responsible for any wildland fire management action will never subordinate human lives to other values. Assuring visitor safety will take priority over fire suppression and monitoring activities. All key fire management personnel are issued the National Wildfire Coordinating Group Fireline Handbook 410-1. Consistent, accurate monitoring and evaluation of fire behavior in the park will provide the basis for developing contingency plans, contacts, and briefings that ensure public and personnel safety.

Although fires are a natural part of the Voyageurs National Park ecosystem, they have not been part of the visitor's experience because of our past suppression policies. Ideally, through education and experience, natural fires will become accepted as part of the risk associated with a national park visit, just as high winds, isolation and lightning storms are now. Following are Voyageurs' public safety considerations:

- A. The major visitor use is concentrated along shorelines near developed and undeveloped campsites and day use sites, and portages.
- B. All use of private and retained use and occupancy cabins by park neighbors is concentrated along shorelines.
- C. There is relatively limited use of the park's trail system, except for the Locator Lake Trail and the south end of the Cruiser Lake Trail.
- D. Opportunities for visitors and neighbors to escape a large, fast-moving fire may be limited along a trail. For those using portages and campsites, day use sites, and cabins along shorelines, opportunities for escape are readily available.
- E. Some individuals will approach a wildland fire for resource benefit or prescribed fire and may even attempt suppression action.
- F. Certain areas will be closed when the risk to visitors, and private and retained use and occupancy cabin users is deemed unacceptable.

- G. Any time human life is endangered, all necessary means will be taken to warn or evacuate visitors, and private and retained use and occupancy cabin users.
- H. Visitors will frequently ignore warnings or are unaware of potential dangers and thus wander through burning areas.
- I. The public generally has not perceived any direct threats to their safety from prescribed fires in national parks.

The Area Fire Management Officer will inform other divisions of all potentially hazardous natural or prescribed fires in the park. The Public Information Officer and Area Fire Management Officer will then coordinate public notification efforts within and outside the park. The extent of public notice will depend on the specific fire situation. The information actions to be considered:

- A. Initial attack/monitoring/burn team members will determine the proximity of visitors and neighbors to the fire, inform them of potential hazards, and aid in their evacuation if necessary.
- B. When a wildland fire is in progress, information listing location, behavior, expected dangers, areas to avoid, and precautions to be taken will be posted on park bulletin boards and at visitor centers and distributed to resorts. Interpretative specialists will be utilized to inform the public of dangers as well as interpret the role of fire in natural areas.
- C. A fire safety brochure that describes travel and evacuation precautions, entrapment procedures, and fire survival procedures in vehicles and buildings will be developed for distribution to park visitors and neighbors.
- D. When the hazards from a wildland fire are high, signs on trails leading into the fire activity area will be posted. Trails, campsites, day use sites, and cabin sites will be closed if deemed necessary by the park Fire Management Committee, and as approved by the Superintendent. The Prescribed Burn Boss will ensure that closure and/or informational signs on prescribed fires are properly posted.
- E. Visitor use will be limited or prevented near wildland fires and potentially affected areas. NPS personnel will patrol the perimeter of fires burning along the lakeshore to inform visitors and neighbors about the role of fire in a natural area, explain the risks associated with approaching too close to a fire, and enforce visitor compliance with area closure orders.
- F. A Wildland Fire Status Summary will be kept by the park Dispatcher. During periods of fire activity, crews and teams will be kept informed of the status of ongoing fires by the use of a daily Wildland Fire Status Summary broadcast on park net after the morning fire weather forecast. This status summary will also be distributed to all park divisions on a daily basis.

- G. News articles will be written and released to local newspapers, radio, and television stations.
- H. As the park's web site capabilities increase, consideration will be given to posting available fire information on the web site.
- I. The Area Fire Management Officer will notify the following agencies of government about fire activities in the park: Koochiching and St. Louis County Sheriffs, Federal Aviation Administration, National Weather Service, Minnesota Department of Natural Resources, Ontario Ministry of Natural Resources, and Superior National Forest.
- J. Burned areas will be posted at trailheads, campsites, day use sites, and cabin sites if potential hazards exist. Trails, campsites, day use sites, and cabin sites will remain closed until all hazard trees are removed from the vicinity of the site. The public will be informed of hazards and appropriate safety precautions associated with traveling through or camping in burned areas.

SECTION X. PUBLIC INFORMATION AND EDUCATION

The National Park Service has a long and proud tradition of fire suppression within units of the National Park System and, until the late 1960's supported a philosophy that all fires must be controlled as quickly and as completely as possible. These traditional values concerning fires, particularly looking at the tremendous success of the Smokey Bear Program, have largely been accepted by the general public, so much so that to change these policies may cause confusion and non-acceptance by some.

Disseminating information about fire's natural role and effects is an important step in establishing public support for such programs (Stankey 1976, McCool and Stankey 1986). Voyageurs' wildland fire management information program will be factual, straightforward, and aimed at many different audiences. The following guidelines will be followed:

- A. The Chief Education and Planning (Public Information Officer) will be kept informed daily by the Area Fire Management Officer of management actions, and the status of fires in the park.
- B. Ecological concepts upon which the wildland fire management program is based will be incorporated into information handouts, selected books written about the park, park web page, and wayside and visitor center exhibits.
- C. Information handouts explaining the fire management program will be prepared and periodically updated. During periods when management fires are burning, these handouts will be distributed to visitors at park information boxes and visitor centers, and by NPS field personnel during informal contacts out in the park.

- D. The fire management program will be incorporated into appropriate interpretative talks, walks, automatic slide and/or video-taped programs, the park newspaper, the park safety brochure, the park camping and hiking brochure, park web page, and wayside and visitor center exhibits. Particular attention will be given to these activities when fires are conspicuous from visitor centers and/or local communities.
- E. During ongoing fires, news articles will be written and released to local newspapers, radio, television stations and posted on the park web site.
- F. Articles will also be written about Voyageurs' fire management program and released for publication in statewide, regional, and national periodicals.
- G. Public information outlets for neighboring land management agencies will be provided with fire management information, particularly when ongoing fires are burning in the park.
- H. To effectively answer visitor questions, every NPS and concession employee in the park will be made aware of the wildland fire management program and the status of ongoing fires.
- I. The Lake States Interpretative Association will make available relevant, factually accurate sales publications that address fire's role in natural areas to visitors at its sale outlets.
- J. The wildland fire management program will be discussed in informal contacts with all divisions, park concessioners, special use permittees, park neighbors, and park visitors.
- K. Signs notifying the public about ongoing wildland fire use fires, prescribed fires, and unwanted wildland fires, area closures, dense smoke, or other special situations will be placed along roadways, and at visitor centers, boat launching ramps, trailheads, campsites, day use sites, cabin sites, and resorts.

SECTION XI. PROTECTION OF SENSITIVE RESOURCES

A. Archeological / Cultural / Historic Resources

Voyageurs National Park's archeological and historical resources are a limited, fragile, and nonrenewable part of the environment that must be protected; when disturbed, the scientific information they provide is often lost forever. Public concern for cultural resources protection and preservation is contained in numerous pieces of legislation that have been passed since the Antiquities Act in 1906. Great care will be taken during fire suppression and prescribed fire activities in Voyageurs not to destroy or disturb important archeological and historical resources. Although a complete ground survey and inventory with detailed maps of sites, features, and environmental data are the best sources of cultural resources information for fire management

planning, archeological and historical site surveys in the park are still incomplete. Completion of these surveys is therefore of the greatest importance.

Fire management activities that disturb the ground in any way, such as fireline construction using hand tools or heavy equipment, in Voyageurs National Park will use paraprofessional and professional archeologists working in cooperation with firefighters and preburn preparation crews to prevent needless cultural resource destruction. It must be recognized that during an unwanted wildland fire the highest priorities are safety and controlling the fire; therefore, if the fireline cannot be diverted, cultural resources may have to be sacrificed. In most cases, however, damage can be averted. During fire suppression, prescribed fire, and rehabilitation activities (Anderson 1985):

- Resource base maps showing archeological and historical site locations will be given to archeologists and incident commanders on the firelines.
- When numerous cultural resources are threatened by a fire, archeologists will be present to help mitigate the impacts of fire suppression and rehabilitation on cultural resources.
- Priority will be given to monitoring heavy equipment through all aspects of the suppression and rehabilitation efforts.
- Archeologists serving on a fireline as technical specialists must hold a current red card to perform their specific advisory duties. If their duties do not require them to be on the actual fire, then a red card is not required.
- Line archeologists will be equipped with appropriate standard firefighting safety equipment.
- Special flagging will be used to identify archeological and historical sites.
- A photographic record will be kept of all archeological materials uncovered during fire management and rehabilitation activities.
- The Cultural Resource Management Specialist will coordinate all activities of line archeologists with fire bosses.

B. Natural Resources

Minimum Impact Suppression Tactics (see Section IV.C.7.) are the primary procedures for protecting natural resources in the park during suppression activities. All eagle nests, gray wolf den locations, sensitive plant locations which fall within or in close proximity to prescribed fire units, will receive mitigation in prescribed fire burn plans to ensure they are not impacted.

C. Developments, Infrastructure, Inholdings

Protection of these resources will involve:

1. Increased prevention awareness in these areas (see Fire Prevention Plan, Appendix I.)
2. Priority for initial attack and aggressive suppression actions in these areas (see Section IV.4.).
3. Emphasis on hazard fuel reduction (both prescribed fire and mechanical treatment).
4. Creation of defensible space around buildings.

Real Property Values at risk include the following:

- Kabatogama Visitor Center – 8 units
- Kettle Falls – 12 units
- Rainy Lake Visitor Center – 2 units
- Sandpoint Lake Ranger Station - 3 units
- Use and Occupancy Cabins – 90 units
- Whispering Pines/Ash River Visitor Center – 14 units

In addition to park improvements, and values of concern identified in the Resource Management Plan, there are 63 tracts totaling 1,482 acres in private ownership of which 41 are improved with summer residences. These tracts are of special concern for wildland fire suppression and an emphasis for hazardous fuel reduction work. Administrative sites, campgrounds and other improvements are to be protected.

SECTION XII. FIRE CRITIQUES AND ANNUAL PLAN REVIEW

All fires and prescribed fires occurring with the park will receive, at a minimum, a review by those involved to evaluate such topics as: the initial response, control methods used, safety concerns, and the need for new and replacement equipment. In addition to the members of the park Fire Management Committee, the critique should be attended by the Incident Commander and/or Prescribed Burn Boss, District Rangers, and other staff members with special knowledge or interest in the particular fire. The purpose of this review is to recognize and document actions that were successful and identify and rectify the actions that were unsafe or ineffective.

The critique will document for future reference any recommendations on changes in fire procedures, prescriptions to achieve different fire effects, or needs for additional training to increase program effectiveness and efficiency.

Voyageurs' wildland fire management program will be reviewed on an annual basis to determine the necessity for revisions by the Fire Management Staff with input from park staff. Specific information and documentation needed to make this review include: Individual Fire Reports (DI-1202), WFIPs, WFSAs, Fire Monitoring Forms, Prescribed fire Plans, and individual fire critiques.

An informal fire management program review will be conducted annually to evaluate current procedures and identify any needed changes to the park FMP. A formal fire management review will be conducted every five years. The park Superintendent must approve significant changes to the body of this plan. The only exceptions to this procedure will include: grammatical corrections, minor procedural changes, deletions, corrections, and additions to the appendices. Copies of all changes will be promptly forward to the Regional Fire Management Office. Changes requiring approval and concurrence will be submitted with a new cover sheet for signature and dates, which will replace the original cover sheet upon receipt by the Superintendent.

The Superintendent or his/her delegate will conduct close-out meetings with Incident Management Teams and Fire Use Teams to ensure a successful transition of the incident back to the park and to identify and evaluate incomplete fire business. Refer to RM-18, Chapter 13, Exhibit 1 for a sample close-out.

A regional or national level fire review may be conducted if one of the following occurs:

- Fire crosses the park boundary onto another jurisdiction without the approval of landowner or agency.
- Fire resulted in adverse media attention.
- Fire involved serious injury or death, significant property damage, or has the potential to do so.
- Fire results in controversy involving another agency.

Refer to RM-18, Chapter 13, Exhibits 2&3.

All entrapments and fire shelter deployments will be reported and investigated as soon as possible after the deployment incident. Refer to RM-18, Chapter 13, Exhibit 4 & 5.

SECTION XIII. CONSULTATION AND COORDINATION

The following agencies, organizations and individuals were consulted in preparing this plan:

Bruce Hawkinson, MNDNR – Ecological Services Div. Welch MN.

Kevin Hop, Project Team Leader, USGS Upper Midwest Environmental Science Center, La Crosse WI.

Steve Jakala, Assistant Fire Management Staff Officer, Superior National Forest, Grand Rapids MN.

Doug McRae, Forest Fire Research Scientist, Canadian Forest Service, Sault Ste. Marie, ONT.

Becky Marty, Resource Manager, MNDNR – Itasca State Park

Shannon Menard, Senior Regional Ecologist, Assoc. for Biodiversity Information, Minneapolis, MN.

U.S. National Park Service, Voyageurs National Park Resource Management Staff

U.S. National Park Service, Voyageurs National Park Fire Management Staff

U.S. National Park Service, Midwest Regional Staff

Dan Stinnett, Field Supervisor, U.S. Fish and Wildlife Service, Twin Cities Ecological Services Office

Mark White, UMD-NRRI-CWE, Duluth, MN.

Gordie Adams Jr., Bois Forte Tribal Council, Nett Lake, MN

Since this is a rewrite of the original 1989 FMP, the list of those consulted is included as well:

Consultation and Coordination List from 1989 Plan

Steve Botti, Fire Management Specialist, NPS Branch of Fire Management, Boise, ID
Citizens' Council on Voyageurs National Park, International Falls

Crane Lake Volunteer Fire Department

Dr. Miron Heinselman, Adjunct Professor, University of Minnesota, Minneapolis

International Rainy Lake Board of Control, Hull, Quebec

Island View Volunteer Fire Department

Kabetogama Lake Volunteer Fire Department, Ray

Koochiching County Land and Forestry Department, International Falls

Minnesota Department of Natural Resources; State, Region II, and International Falls Offices, and the Kabetogama and Pine Island State Forests

Minnesota Incident Command System (MNICS) Task Force Coordinator, St. Cloud

Minnesota Pollution Control Agency, Duluth

Minnesota State Historic Preservation Office, St. Paul

Ontario Ministry of Natural Resources; Atikokan and Fort Frances Districts

St. Louis County Land Department, Duluth

U. S. Army Corps of Engineers, St. Paul

U. S. Fish and Wildlife Service, St. Paul

U. S. Forest Service, Superior National Forest; Forest Supervisor's Office and LaCroix Ranger District

U. S. National Park Service; Voyageurs N.P., Midwest Regional Office, and Boise Interagency Fire Center Staffs

Dr. Jan van Wagtenonk, Research Scientist, NPS, Yosemite N.P., CA

Voyageurs Region National Park Association, Minneapolis

SECTION XIV.

APPENDICES

SECTION XIV. APPENDICES

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B. Definitions

Appropriate Management Response – the response to a wildland fire is based on an evaluation of risks to firefighter and public safety, the circumstances under which the fire occurs, including weather and fuel conditions, natural and cultural resource management objectives, protection priorities, and values to the protected. The evaluation must also include an analysis of the context of the specific fire within the overall local, geographic area, or national wildland fire situation.

Daily revalidation – A process named the periodic fire assessment, which evaluates the continued capability of the local unit to manage the fire for resource benefits, and to determine if the fire is escalating in complexity and operational needs. This process is completed as frequently as specified by the local unit.

Decision criteria checklist (Initial Go/No-Go Decision) – A set of standard evaluation criteria to determine if the current wildland fire meets criteria to be managed for resource benefits. The completion of these criteria will lead to a decision to “Go/No-Go” with management of the fire for resource benefits.

Expected weather conditions - those weather conditions indicated as common, likely, or highly probable based on current and expected trends and their comparison to historical weather records. These are the most probable weather conditions for this location and time. These conditions are used in making fire behavior forecasts for different scenarios (one necessary scenario involves fire behavior prediction under "expected weather conditions").

Disturbance – any relatively discrete event, either natural or human induced, that causes a change in the existing condition of an ecological system.

Confine - the strategy employed in appropriate management responses where a fire perimeter is managed by a combination of direct and indirect actions and use of natural topographic features, fuel, and weather factors.

Ecological process – the actions or events that link organisms and their environment, such as predation, mutualism, successional development, nutrient cycling, carbon sequestration, primary productivity, and decay.

Ecosystem management – the careful and skillful use of ecological, economic, social, and managerial principles in managing ecosystems to produce, restore, or sustain ecosystem integrity and desired condition over the long term.

Ecosystem sustainability – the ability to sustain diversity, productivity, resilience to stress, health, renewability, and/or yields of desired values, and resource uses from an ecosystem while maintaining the integrity of the ecosystem over time.

Escaped fire – a fire which has exceeded or is expected to exceed initial attack capabilities or prescription.

Fire complexity analysis – A process for assessing wildland fire organizational needs and relative complexity in terms of ICS types (I, II, III etc.).

Fire Management Unit - any land management area definable by objectives, topographic features, access, values-to-be-protected, political boundaries, fuel types, or major fire regimes, etc., that sets it apart from management characteristics of an adjacent unit. FMUs are delineated in Fire Management Plans (FMP). These units may have dominant management objectives and pre-selected strategies assigned to accomplish these objectives.

Fire dependent or fire maintained ecosystems - an ecosystem can be called fire dependent or fire maintained if periodic perturbations by fire are essential to the functioning of the system.

Fire exclusion – the disruption of a characteristic pattern of fire intensity and occurrence (primarily through fire suppression).

Fire evaluation - the process of examining and appraising fire monitoring information.

Fire monitoring - the act of observing a fire to obtain information about its environment, behavior, and effects for the purpose of evaluating the fire and its prescription.

Fire prescription - a written statement defining the objectives to be attained, and the conditions of temperature, humidity, wind direction and speed, and fuel moisture, under which a fire will be allowed to burn. Generally expressed as an acceptable range of the various indices, and the limit of the geographic area to be covered.

Fire regime – the fire pattern across the landscape, characterized by occurrence interval and relative intensity. Fire regimes result from a unique combination of climate and vegetation. Fire regimes exist on a continuum from short-interval, low-intensity (stand maintenance) fires to long interval, high-intensity (stand replacement) fires.

Fire return interval – the number of years between two successive fires occurring in a designated area.

Fire use – the combination of wildland fire use and prescribed fire application to meet resource objectives.

Hazard fuels – excessive live and/or dead wildland fuel accumulations (either natural or created) having the potential for the occurrence of uncharacteristically intense wildland fires.

Holding actions - planned actions required to achieve wildland and prescribed fire management objectives. These actions have specific implementation timeframes for fire use actions but can have less sensitive implementation demands for suppression actions. For wildland fires managed for resource benefits, an MMA may not be totally naturally defensible. Specific holding actions are developed to preclude fire from exceeding the MMA. For prescribed fires, these actions are developed to restrict the fire inside the planned burn unit. For suppression actions, holding actions may be implemented to prohibit the fire from crossing containment boundaries. These actions may be implemented as firelines are established to limit the spread of fire.

Initial attack – an aggressive suppression action consistent with fire fighter and public safety, and with values to be protected.

Management action points - also called "trigger points." Either geographic points on the ground or specific points in time where an escalation or alteration of management actions is warranted. These points are defined and the management actions to be taken are clearly described in an approved Wildland Fire Implementation Plan (WFIP) or Prescribed Fire Plan. Timely implementation of the actions when the fire reaches the action point is generally critical to successful accomplishment of the objectives.

Maximum Manageable Area (MMA) - MMA defines the firm limits of management capability to accommodate the social, political, and resource impacts of a wildland fire. Once established as part of an approved plan, the general impact area is fixed and not subject to change. MMAs can be developed as part of the FMP and described as a Fire management area or FMA. They can also be developed as part of the planning and implementation of management actions after a fire has ignited. If they are developed after the ignition, their definition will occur during the Wildland Fire Implementation Plan Stage III process. In the event a fire occurs in a pre-planned MMA or FMA and the local unit determines that this MMA is not the best-suited alternative for the present conditions, a new MMA can be developed as part of the Stage III process. Once this occurs, the Stage III MMA becomes the firm limits of the fire and is fixed.

Mitigation actions - Mitigation actions are considered to be those on-the-ground activities that will serve to increase the defensibility of the MMA; check, direct, or delay the spread of fire; and minimize threats to life, property, and resources. Mitigation actions may include mechanical and physical non-fire tasks, specific fire applications, and limited suppression actions. These actions will be used to construct firelines, reduce excessive fuel concentrations, reduce vertical fuel continuity, create fuel breaks or barriers around critical or sensitive sites or resources, create "blacklines" through controlled burnouts, and to limit fire spread and behavior.

Normal fire year – The normal fire year for suppressed wildland fires is the year with the third highest number of wildland fires in the past ten years of record. The normal wildland fire managed for resource benefits year is the year with the third highest number of acres burned by wildland fire managed for resource benefits in the past ten years of record.

Preparedness - Activities that lead to a safe, efficient and cost effective fire management program in support of land and resource management objectives through appropriate planning and coordination. This term replaces presuppression.

Natural ignition – a wildland fire ignited by a natural event such as lighting or volcanoes.

Prescription – a set of measurable criteria that guides the selection of appropriate management strategies and actions. Prescriptions criteria may include safety, economic, public health, environmental, geographic , administrative, social, or legal considerations.

Prescribed fire – any fire ignited by management actions to meet specific objectives. Prescribed fires are conducted in accordance with prescribed fire plans.

Prescribed fire plan – a plan required for each prescribed fire. Plans are documents prepared by qualified personnel, approved by the agency administrator, and include criteria for the conditions under which the fire will be conducted (a prescription).

Wildland fire – any non structure fire that occurs on wildland.

Wildland Fire Implementation Plan (WFIP) – a progressively developed assessment and operational management plan that documents the analysis and selection of strategies and describes the appropriate management response for a wildland fire being managed for resource benefits.

Wildland Fire Use – the management of naturally ignited wildland fires to accomplish specific pre-stated resource management objectives in predefined geographic areas outlined in fire management plans.

Wildland fire management - all activities related to the prevention, control or use of fire burning through vegetation under specific prescriptions for the purpose of achieving fire management objectives.

Wildland fire situation analysis (WFSA) – a decision making process that evaluates alternative management strategies against selected safety, environmental, social, political, and economic criteria.

C. Species Lists

Rare Plant Communities and Species of Special Interest of Voyageurs National Park:

State-Listed Plant Species

Species	Common Name	Status
<i>Caltha natans</i>	Floating marsh marigold	State – Endangered
<i>Pseudocypherella crocata</i>	lichen species	State – Endangered
<i>Poa paludigena</i>	Bog bluegrass	State – Threatened
<i>Subularia aquatica</i>	Awlwort	State – Threatened
<i>Tillaea aquatica</i>	Pigmyweed	State – Threatened
<i>Fimbristylis autumnalis</i>	Autumn sedge	State – Special Concern
<i>Potamogeton vaseyi</i>	Vasey's pondweed	State – Special Concern
<i>Ranunculus lapponicus</i>	Lapland buttercup	State – Special Concern
<i>Chaenothecopsis</i>	lichen	State – Special Concern
<i>pseudorangiformis</i>		
<i>Sticta fuliginosa</i>	lichen species	State – Special Concern
<i>Tomenthypnum falcifolium</i>	lichen species	State – Special Concern

Species	Common Name	Status
<i>Arethusa bulbosa</i>	Dragon's mouth	State – Tracked
<i>Elatine triandra</i>	Waterwort	State – Tracked

Federal Endangered Species

No federally listed endangered animals have been observed in the park.

Federal Threatened Species

Threatened species are assumed to be vulnerable to become endangered, and so are offered protection similar to that for endangered species.

Bald Eagle (*Haliaeetus leucocephalus*)

The bald eagle is a federal threatened species, and is listed as a species of special concern by the state of Minnesota. A total of 175 nests have been counted and monitored in and immediately adjacent to the park since 1973. (Grim, pers comm 7/99).

Gray wolf (*Canis lupus*)

Northern Minnesota and Voyageurs National Park host some of the highest density wolf population in North America. The population in Minnesota has recovered so vigorously during the past 25 years that it may soon be proposed for removal from the Endangered Species list.

Canada lynx (*Lynx canadensis*)

The lynx was listed as a federal threatened species in April, 2000. The lynx is a boreal species, and is near its southern limit in the park. Lynx have been recorded in areas surrounding the park but have not been recently recorded in the park. Besides hares, it feeds on carrion, grouse, squirrels and occasionally deer fawns, foxes and porcupines. Lynx are extremely sensitive to the presence of humans, and require large home ranges without human disturbance (Heinselman 1996).

State Endangered Species

Species listed on the state list as threatened, endangered, or as species of concern are not protected, but are monitored and may become candidates for the federal list.

No animals on the Minnesota list of endangered species live in the park, although the piping plover (*Charadrius melodus*) may pass through the park and is considered a rarely seen transient (Grim 1986).

State Threatened Species

Common tern (*Sterna hirundo*)

The common tern is a state threatened species, and is monitored by state wildlife managers for possible future listing on the federal endangered and threatened species list. The park also monitors terns and in 1999 initiated a recovery effort.

Other species of birds on the state list of threatened species that rarely pass through the park on their way north or south include Wilson's phalarope (*Phalaropus tricolor*) and the horned grebe (*Podiceps auritus*).

State Species of Special Concern

These species have no formal status with the state of Minnesota, but are deemed by the state of Minnesota to merit close monitoring and management attention.

Northern bog lemming (*Synaptomys borealis*)

Experts suggest that the Northern bog lemming exists in the park, but it has not yet been documented. Because of its behavior, the northern bog lemming is extremely hard to trap. Researchers may sample for years in the same area before finding a northern bog lemming. Where it occurs, this small mouselike mammal inhabits tamarack and spruce bogs and wet grassy meadows, and feeds on grasses, sedges and leaves of bog heath shrubs, including blueberries (Heinselman 1996).

Lake sturgeon (*Acipenser fulvescens*)

Commercial fishing in the early 1900s decimated the lake sturgeon. The sturgeon has still not fully recovered and is considered uncommon in park waters. Because they reach sexual maturity at a late age (17+ years), they are slow to recover from disturbance. Lake sturgeon feed on snails, clams, crayfish and insects in the shallows of productive lakes. Sturgeon spawn in large tributary rivers or occasionally on shoals in the large lakes in late May and June. At 50 years, they may reach 5 feet in length and weigh 50 to 60 pounds (Heinselman 1996).

White pelican (*Pelecanus erythrorhynchos*)

In 1932, no pelican breeding colonies existed in Minnesota. By the mid-1970s, this species had re-established two breeding colonies in Minnesota. Another breeding colony existed on the Ontario side of Lake of the Woods, about 100 miles west of the (NPS 1994). Park employees have observed a significant increase in the number of pelicans visiting the park area during the summer since 1973, and have assumed these foraging birds originate from the Lake of the Woods colony. Potential breeding areas for pelicans may exist in the park, and it is possible that the birds will eventually establish a breeding colony in the park.

Other birds listed as Minnesota species of special concern and that occasionally pass through the park while migrating include the short-eared owl (*Asio flammeus*), yellow rail (*Coturnicops noveboracensis*) and marbled godwit (*Limosa fedoa*).

Species Monitored by the Park

The following species are not threatened by extinction, but are monitored by the park either because of their ecological or cultural importance.

- Ungulates (Moose-Deer-Caribou)
- Beaver
- Black Bear
- Osprey
- Common Loon
- Colonial nesting waterbirds (cormorants, gulls, herons)

D. NEPA and NHPA Compliance

An environmental assessment has been completed for this Fire Management Plan and is considered an unattached appendix. See Voyageurs National Park Fire Management Plan Environmental Assessment. When a decision is reached by the Decision Maker, the Finding of No Significant Impact (FONSI) will be attached here.

E. Supplemental Information

1. Contact List

Key Fire Contact List

Voyageurs National Park

Park Headquarters (International Falls)	(218) 283-9821
Rainy Lake Visitor Center	(218) 286-5258
Kabetogama Lake Visitor Center	(218) 875-2111
Kabetogama Lake Visitor Center (Law Enforcement)	(218) 875-2116
Kabetogama Lake Visitor Center (Maintenance)	(218) 875-2117
Ash River Visitor Center (Kab Narrows)	(218) 374-3221
Ash River Maintenance Area (Bldg 94)	(218) 374-3611
Kabetogama Lake Ranger Station	(218) 875-2116
Crane Lake Ranger Station	(218) 993-2481

Minnesota Department of Natural Resources

Minnesota Interagency Fire Center (MIFC)	(218) 327-4436
DNR Forestry (Orr)	(218) 757-3274
DNR Forestry (Kabetogama)	(218) 757-3489
DNR Forestry (International Falls Workstation)	(218) 286-3334
DNR Forestry (Littlefork)	(218) 278-6651
Minnesota Interagency Fire Center (MIFC Dispatch)	(218) 327-4558
Minnesota Interagency Fire Center (Aircraft Dispatch)	(218) 327-4582

Superior National Forest

Minnesota Interagency Fire Center (MIFC Dispatch)	(218) 327-4558
Superior National Forest Dispatch (MIFC)	(218) 327-4176
Superior National Forest (LaCroix District)	(218) 666-0020
Superior National Forest (Kawishiwi District)	(218) 365-7600
Superior National Forest (Seaplane Hangar)	(218) 365-7565
Superior National Forest (Air Tanker Base)	(218) 365-4831

Ontario Ministry of Natural Resources

Fort Frances Fire Headquarters	(807) 274-8643
Atikokan Fire Headquarters	(807) 937-7210
Thunder Bay Fire Headquarters	(807) 476-2200
Dryden Fire Headquarters	(807) 937-4402
Dryden (Hangar)	(807) 937-7255

Other Cooperating Associations

International Falls Fire Department	(218) 283-9151
Kabetogama Volunteer Fire Department	(218) 875-2121
Crane Lake Volunteer Fire Department	(218) 993-2287

Regional/Eastern Area

Midwest Region Fire Mgt Officer Fred Bird (Omaha)

(402) 221-3475

Cell (402) 630-0685

Eastern Interagency Fire Coordination Center,
USFS Zone 9 (St. Paul)

(612) 713-7300

NOAA National Weather Service Offices

Duluth

(218) 729-6572

Chanhassen

(952) 361-6671

Fire Call-up List

**VOYAGEURS NATIONAL PARK
FIRE CALL LIST**

April 2002

Voyageurs National Park Callout list is update and inserted into the working copies of this plan. Due to the listing of home phone numbers, it will not be included in the published copies of this plan.

2. Cooperative Agreements

Voyageurs National Park's Current Wildland Fire-Related Agreements

Date	With Whom	Title of Agreement	Purpose	Update Status	Related to	Expires
2-94	MNICS Partners	MNICS Charter	Member organization to operate under NIIMS (ICS)-parent agreement for MNICS	Current		N/A
9-90	MNICS Partners	Implementation Plan	Implementation plan for the Interagency Coordination Center	Current	Financial Plan	N/A
4-97	MNICS Partners	Interagency agreement for MIFC	Authorizes MIFC operations		MNICS	2001
07-01	MNICS Partners	MIFC Operating Plan	Operating plan for MIFC Dispatch & financial plan			Annual
11-96	DNR, USFS, USFWS, BIA, NPS	MOU for RX Fire	Authorizes cooperation on RX fire			2006
9-01	NPS & DNR	Agreement between DNR and NPS for shared protection responsibilities	Sharing initial attack resources and boundary fires between each NPS unit in MN and the DNR. How and when to bill each other.	Current		9-06
	Ontario Ministry of Natural Resources, USFS, NPS, MNDNR	Border Waters Agreement	Sharing fire fighting resources between US and Ontario			

3. Current FIREPRO Analysis (To be added to final plan)

4. Sample Delegation of Authority Letters

a. Delegation of Authority to Incoming Incident Commander

DELEGATION OF AUTHORITY

As Line Officer in charge of Voyageurs National Park, I have the responsibility for protection of the resources and the lives of Park visitors and all employees. Your expertise in the area of fire management will assist me in fulfilling that responsibility during the present incident. By means of this memorandum on this day of _____ at _____ hours, I am delegating to you the authority to carry out the task of managing the suppression of the _____ incident in accordance with the attached line officer's briefing statement.

The statement will provide you with my priorities in fire suppression, specific restraints which are necessary to protect cultural and natural resources and other guidelines for carrying out your overall task of fire suppression on this unit. In addition, the Line Officer's Briefing Statement will provide you with names of certain individuals who have been assigned to assist you in carrying out your duties and a list of facilities which may be available to you under the conditions stated. A fireline briefing will be conducted on site by the current local Incident Commander. Either myself or my delegated representative will be available to you and your staff for advice and council.

Date _____
(Park Superintendent)

Date _____
(Incident Commander – Incoming Team)

b. Delegation of Authority for Wildland Fire Use Management Team

Voyageurs National Park

DELEGATION OF AUTHORITY

Sample Fire

September 30, 2001

_____ is assigned as the Team Leader for the Long Term Assessment of the _____ Fire (MN-VOP-???). You have full authority and responsibility for completing the planning efforts within the framework of law, National Park Service policy and direction provided in the Wildland Fire Implementation Plan Stage III and this Delegation.

Specific direction includes:

- _____, Area Fire Management Officer, will be assigned as the Agency Representative.
- _____, Chief Resource Management, will be assigned as the Resource Advisor.
- The Park will retain initial attack and suppression responsibilities.
- Firefighter and public safety is the primary objective and should be included in all planning actions.
- Facility and development protection areas are:
 - Cultural sites as identified by the park Cultural Resource Specialist
 - Park developed areas
 -
 -
- The Team will complete a Long Term Assessment Plan for the _____ Fire. At the request of the MWR Fire Management Office, the Plans shall also include a Community Protection Assessment, an evaluation of the full range of adverse effects of the fires, on safety, cultural, social, economic, environmental, and social elements.
- MIST tactics and minimal tool requirements will be a consideration.
- All requests for supplies or resources should be placed through the Voyageurs Fire Management Office.

- The Team is responsible to understand local aviation protocols and coordinate aviation activities with the Agency Representative. One aviation resource has been assigned and one Park resource can be scheduled for use.
- Release of the Team will occur when agreed to by the Agency Representative and Assessment Team Leader. Completed Long Term Assessment Plans and any related documentation will be provided to Voyageurs National Park upon release.

Superintendent, Voyageurs National Park

Date

Assessment Team Leader

Date

F. Monitoring Plan (To be added to final plan)

G. Preattack Plan

As stated in Section IV.C.3., this Preattack plan will be upgraded as time and staff permit.

1. Command

- Draft Delegation of Authority: See Section XIV.E.6.
- Interagency Agreements: See Section XIV.E.3.

2. Operations

- Helispot and Cache Location Map (Figure G-1):

INSERT FIG. G-1 (CACHE LOCATION AND HELISPOT MAP) HERE

3. **Logistics**

- Fire Departments: See XIV.E.5.

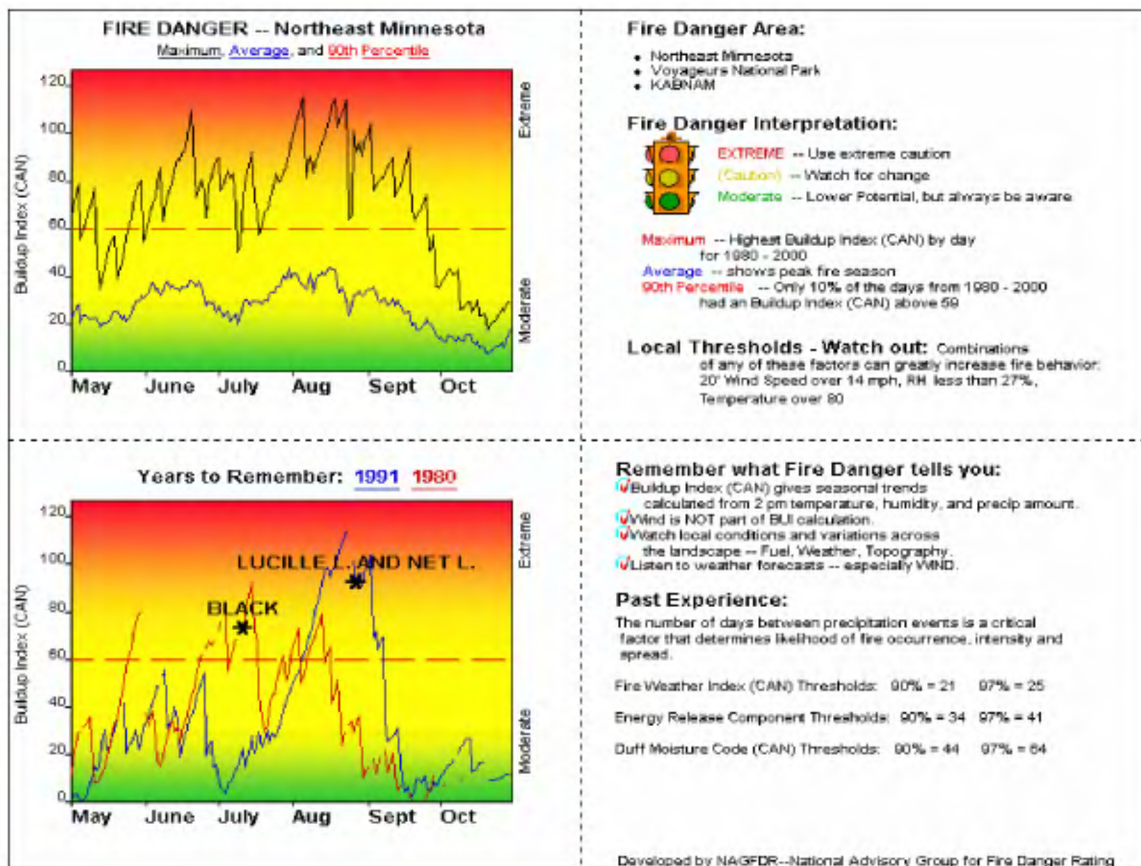
4. **Planning**

- Vegetation/Fuel maps: See Section I. for Fuels Maps

- Archeological/cultural base map: See Fire Call-up List Files.
- Endangered species critical habitats: See Fire Management or GIS files
- Sensitive plant populations: See Fire Call-up List Files

5. Safety

Attached is a Pocket Card describing critical fire danger indices and conditions present during past large fire events at Voyageurs National Park. It is intended for use by firefighters from outside the Park who might be ordered to Voyageurs to assist in wildland fire use or suppression actions:



H. Long-Term Prescribed Fire and Hazard Reduction Plan

The long-term prescribed fire and hazard reduction plan for Voyageurs National Park is based on the emphasis areas described in Section V. of the FMP. Table H-1 is a summary of the 5 year plan. Figure H-1 is a map of the 5 year plan.

Table H-1

VOYAGEURS NATIONAL PARK 5 YEAR BURN PLAN				
<u>Fiscal Year</u>	<u>Name</u>	<u>Location</u>	<u>Type</u>	<u>Acres</u>
2002	Bullwinkle	T 70N, R 20W, Sec 21	G	246
	Whispering Pines I	T 69N, R 20W, Sec 25	U	19
	Tar Point	T 69N, R 20W, Sec 21	U	20
	Ryan Lake Southeast	T 70N, R 18W, Sec 30	U	<u>136</u>
				421
2003	Cranberry	T 71N, R 21W, Sec 32	G	425
	Net Lake East	T 68N, R 18W, Sec 3	U	165
	Meander Corner	T 70N, R 18W, Sec 31	U	51
	Whispering Pines II	T 69N, R 20W, Sec 25	U	<u>62</u>
				703
2004	Rocky	T 69N, R 18W, Sec 34	G	412
	Daley Bay	T 69N, R 20W, Sec 32	U/SR	140
	Ryan Lake North	T 70N, R 19W, Sec 25	U	470
	North Rottenwood	T 70N, R 21W, Sec 19	U	325
	Whispering Pines III	T 69N, R 20W, Sec 25	U	<u>35</u>
				1,382
2005	Frostbite	T 70N, R 22W, Sec 25	G	600
	East Daley II	T 69N, R 20W, Sec 32	U	43
	Fennwick	T 70N, R 21W, Sec 22	SR	1,100
	Whispering Pines IV	T 69N, R 20W, Sec 25	U	<u>52</u>
				1,795
2006	Whiplash	T 68N, R 20W, Sec 5	G	600
	Maelstrom	T 69N, R 19W, Sec 9	SR	1,100
	Whispering Pines V	T 69N, R 20W, Sec 25	U	88
	Whispering Pines VI	T 69N, R 20W, Sec 25	U	<u>19</u>
				1,807
Alternate Burn Units	Randolph Bay	T 69N R 18W, Sec 28	U	375
	Net Lake West	T 68N R 18W, Sec 4	U	94
	Wiyapka	T 68N, R 18W, Sec 5	U	573
	Junction Bay West	T 69N, R 18W, Sec 31	U	274
	Spring Lake	T 68N, R 18W, Sec 10	U	804
	Roothouse Pete	T 68N, R 20W, Sec 4	U	445
	Marion Bay/Findlander Bay	T 70N, R 20W, Sec 8	U	2,500
	Wiyapka Lake East	T 68N, R 18W, Sec 5	U	<u>350</u>
				5,415
Re-entry Units	Blind Ash Bay	T 69N, R 20W, Sec 25	U	333
	Moose Bay	T 69N, R 19W, Sec 26	U	235
	Mica Bay	T 70N, R 18W, Sec 31	U	23
	Willow	T 68N, R 20W, Sec 2	G	40
	Daley Brook West	T 69N, R 20W, Sec 31	G	<u>48</u>
				679
G	Marsh Grass			
U	Understory Burn – Red/White Pine/Mixedwood			
SR	Stand Replacement – Jack Pine			

INSERT FIGURE H-1 (5-YEAR BURN UNIT MAP) HERE

1. Multi-Year Prescribed Fire Schedule

Voyageurs National Park 5-Year Burn Units 2001

Burn unit boundaries were digitized from hand-drawn boundaries on 1:24000 topo-quads. Vegetation acreage was calculated by clipping the park vegetation map (1:15840 scale) with the burn unit boundaries. Geology data were from a 1:250000 scale bedrock geology map. Usable soils data were not available. Water resources (hydrology) data were based off of 1:24000 scale stream data and the park vegetation map. Flood plain / Wetlands data were based off the park vegetation map. T/E/S animal were derived by placing a 1/4 mile buffer around known Bald Eagle nests (2001 survey) and Osprey nests (1999 survey). Wolves were not included as all burn units fall within wolf territories and den location data were not available. T/E/S plants included point location of known plants and lichens. Proposed wilderness was based on the proposed wilderness areas from the park GMP. Park facilities included existing campsites, visitor centers, and maintenance and housing buildings.

FY 2002

Name of the Unit: Bullwinkle, 2002

Area: 355 ac (144 ha)

Type of Burn: Marsh grass

Fuels: Grass, brush.

General Descriptive Location: T 70N R 20W Sec. 21; drainages north of Shoepack Lake.

Purpose of the Burn: To rejuvenate decadent willow and stimulate sprouting of willow species, to reduce annuals and dead herbaceous cover, to prevent build-up of debris on the marsh floor, to reduce the invasion of woody vegetation into this marsh ecosystem (may require multiple burns), and to foster a change in albedo that permits earlier spring growth.

Vegetation Type	Acres	Hectares	
Wet Meadow/Fen Mosaic/Complex	115	47	
Speckled Alder Swamp	39	16	
Deep Marsh Mosaic/Complex	36	15	
Leatherleaf-Sweet Gale Shore Fen	34	14	
Black Spruce/Leatherleaf Semi-treed Bog	26	11	
Northern Water Lily Aquatic Wetland	21	8	
Canada Bluejoint Eastern Meadow	11	4	
Leatherleaf Bog	11	4	
Spruce-Fir-Aspen Forest	11	4	
Quaking Aspen-Paper Birch Forest	8	3	
Midwest Pondweed Submerged Aquatic Wetland	8	3	
Jack Pine-Aspen Forest Mosaic	7	3	
Boreal Pine Rocky Woodland (mixed pine phase)	5	2	
Jack Pine/Balsam Fir Forest	2	1	
Small Island with Trees	2	1	
Northern Tamarack Rich Swamp	2	1	
Spruce-Fir/Mountain Maple Forest	2	1	
Black Ash-Mixed Hardwood Swamp	2	1	
Black Spruce/Labrador Tea Poor Swamp (evergreen phase)	1	0	
Boreal Pine Rocky Woodland (jack pine phase)	1	0	
TOTAL	355	144	
Geology / Soils Metasedimentary rocks, undivided - biotite-quartz-plagioclase schist and metagraywacke.			
Water Resources 6.66 km of streams			
Flood Plain / Wetlands 307 acres (see above)			
Wildlife / Fisheries None Known			
Threatened / Endangered / Sensitive Species		Animals	None Known
		Plants	None Known
Proposed Wilderness Yes			
Park Facilities and Operations None			

Name of the Unit: Whispering Pines I, 2002

Area: 22 ac (9 ha)

Type of Burn: Understory burn

Fuels: Timber – red and white pine – NFFL Fuel Model 9, CFFDRS Fuel Type C-5.

General Descriptive Location: T 69N R 20W Sec. 25; just south and southwest of Ash River Visitor center upper parking lot, bounded by the Meadwood Road and the road to Building 94; elevation between 1150 and 1265 ft (350 and 385 m); slopes generally 2-3% on short ridges with northeast and southwest aspects.

Purpose of the Burn: Hazard fuels reduction, and ecosystem management – allowing fire to play its natural role as an ecosystem process.

Vegetation Type	Acres	Hectares	
White Pine-Red Pine-Quaking Aspen-Paper Birch Forest	12	5	
White Pine/Mountain Maple Mesic Forest	7	3	
TOTAL	22	9	
Geology / Soils	Granite-rich migmatite and Schist-rich migamatite		
Water Resources	None		
Flood Plain / Wetlands	None		
Wildlife / Fisheries	None Known		
Threatened / Endangered / Sensitive Species	Animals	None Known	
	Plants	None Known	
Proposed Wilderness	No		
Park Facilities and Operations	Seasonal Housing - 1 unit		

Name of the Unit: Tar Point, 2002

Area: 16 ac (6 ha)

Type of Burn: Understory burn

Fuels: Timber – red and white pine – NFFL Fuel Model 9, CFFDRS Fuel Type C-5.

General Descriptive Location: T 69N R 20W Sec. 21; Tar Point.

Purpose of the Burn: Ecosystem management – allowing fire to play its natural role as an ecosystem process; reduce undergrowth, open the canopy, decrease litter and duff on the fuel bed, and encourage pine regeneration.

Vegetation Type	Acres	Hectares	
White Pine-Red Pine-Quaking Aspen-Paper Birch Forest	16	6	
TOTAL	16	6	
Geology / Soils	Schist-rich migamatite - Dominantly biotite schist paleosome.		
Water Resources	None		
Flood Plain / Wetlands	None		
Wildlife / Fisheries	None Known		
Threatened / Endangered / Sensitive Species	Animals	None Known	
	Plants	None Known	
Proposed Wilderness	Yes		
Park Facilities and Operations	None		

Name of the Unit: Ryan Lake Southeast, 2002

Area: 125 ac (51 ha)

Type of Burn: Understory burn

Fuels: Timber – 120-year old white and red pine, and mixedwood

Vegetation Type	Area, ac	Area, ha	Percent of Unit	NFFL Fuel Model	CFFDRS Fuel Type
White / red pine	78	32	62	9	C-5
Mixedwood	48	19	38	8	M-2 *

* 80% hardwood, 20% conifer

General Descriptive Location: T 70N R 18W Sec. 30; approximately 0.3 mi (0.5 km) north of Mica Bay on Namakan Lake, 0.25 mi (0.4 km) southeast of Ryan Lake, and 1.0 mi (1.6 km) south of Rainy Lake; bordered by wetland swamps on the east and south, a moist forested drainage on the west, and an old logging road connecting black spruce bogs on the north; elevation ranges from 1161 to 1240 ft (354 to 378 m) with an average 10% slope on south and east aspects and 28% slope on west aspects.

Purpose of the Burn: Hazard fuel reduction, and ecosystem management – replicating natural, low-intensity fire in a fire-adapted ecosystem.

Vegetation Type	Acres	Hectares	
White Pine-Red Pine-Quaking Aspen-Paper Birch Forest	80	32	
Quaking Aspen-Paper Birch Forest	22	9	
White Pine/Mountain Maple Mesic Forest	10	4	
Black Spruce/Alder Rich Swamp	5	2	
Spruce-Fir-Aspen Forest	4	2	
Beaver Basin Break-up Mosaic	2	1	
Trembling Aspen-Balsam Poplar Lowland Forest	1	0	
Wet Meadow/Fen Mosaic/Complex	1	0	
TOTAL	125	51	
Geology / Soils	Metasedimentary rocks, undivided - biotite-quartz-plagioclase schist and metagraywacke.		
Water Resources	None		
Flood Plain / Wetlands	8 acres (see above)		
Wildlife / Fisheries	None Known		
Threatened / Endangered / Sensitive Species	Animals	None Known	
	Plants	None Known	
Proposed Wilderness	Yes		
Park Facilities and Operations	None		

FY 2003

Name of the Unit: Cranberry, 2003

Area: 587 ac (238 ha)

Type of Burn: Marsh Grass

Fuels: Grass, brush.

General Descriptive Location: T 71N R21W Sec. 32; Cranberry Bay, east and west sides of Cranberry Creek, and adjoining drainages; elevation 1,120 ft (341 m).

Purpose of the Burn: To rejuvenate decadent willow and stimulate sprouting of willow species, to reduce annuals and dead herbaceous cover, to prevent build-up of debris on the marsh floor, to reduce the invasion of woody vegetation into this marsh ecosystem (may require several burns), and to foster a change in albedo that permits earlier spring growth.

Vegetation Type	Acres	Hectares	
Wet Meadow/Fen Mosaic/Complex	288	117	
Leatherleaf-Sweet Gale Shore Fen	64	26	
Canada Bluejoint Eastern Meadow	50	20	
Deep Marsh Mosaic/Complex	43	18	
Midwest Cattail Deep Marsh	25	10	
Jack Pine-Aspen Forest Mosaic	19	8	
Northern Water Lily Aquatic Wetland	13	5	
Dogwood-Pussy Willow Swamp	12	5	
Spruce-Fir-Aspen Forest	12	5	
Spruce-Fir/Mountain Maple Forest	10	4	
Quaking Aspen-Paper Birch Forest	9	3	
Speckled Alder Swamp	8	3	
Leatherleaf Bog	6	3	
Jack Pine/Balsam Fir Forest	5	2	
Bog Birch-Willow Shore Fen	4	2	
Boreal Pine Rocky Woodland (jack pine phase)	4	2	
Small Island with Trees	3	1	
Trembling Aspen-Balsam Poplar Lowland Forest	3	1	
Small Island with Shrubs	2	1	
Pin Oak-Bur Oak Rocky Woodland (jack pine-oak phase)	2	1	
Black Ash-Mixed Hardwood Swamp	2	1	
Wild Rice Marsh	2	1	
Pin Oak-Bur Oak Rocky Woodland (mixed pine-oak phase)	1	0	
TOTAL	587	238	
Geology / Soils Metasedimentary rocks, undivided - biotite-quartz-plagioclase schist and metagraywacke.			
Water Resources None			
Flood Plain / Wetlands 522 acres (see above)			
Wildlife / Fisheries None Known			
Threatened / Endangered / Sensitive Species	Animals	1 Osprey nest	
	Plants	None Known	
Proposed Wilderness Yes			
Park Facilities and Operations None			

Name of the Unit: Net Lake East, 2003

Area: 257 ac (104 ha)

Type of Burn: Understory burn

Fuels: Timber – 130-year old white and red pine, and aspen/birch mixedwood

Vegetation Type	Area, ac	Area, ha	Percent of Unit	NFFL Fuel Model	CFFDRS Fuel Type
White / red pine	98	40	38	9	C-5
Mixedwood	139	56	54	8	M-1
Balsam fir	10	4	4	10	M-3
Wetland Marsh	10	4	4	3	O-1b

General Descriptive Location: T 68N R 18W Sec. 3; southeast side of Net Lake and southwest side of Tooth Lake, 0.3 mi (0.5 km) north of the Park boundary; bordered by lakes to the west and northeast, by wetland swamps on the south, and by wet drainage to the west; elevation ranges from 1150 to 1320 ft (350 to 400 m) with an average 44% slope on southeast / northwest aspects.

Purpose of the Burn: Hazard fuel reduction; also, ecosystem management – replicate a natural, low-intensity fire in this fire-adapted ecosystem.

Vegetation Type	Acres	Hectares	
White Pine-Red Pine-Quaking Aspen-Paper Birch Forest	77	31	
Quaking Aspen-Paper Birch Forest	58	23	
Leatherleaf-Sweet Gale Shore Fen	21	8	
Speckled Alder Swamp	20	8	
Leatherleaf Bog	16	7	
Wet Meadow/Fen Mosaic/Complex	15	6	
Spruce-Fir-Aspen Forest	10	4	
Boreal Pine Rocky Woodland (mixed pine phase)	8	3	
Black Ash-Mixed Hardwood Swamp	6	2	
Canada Bluejoint Eastern Meadow	6	2	
Pin Oak-Bur Oak Rocky Woodland (mixed pine-oak phase)	5	2	
Mixed Aspen Rocky Woodland	5	2	
Boreal Hazelnut-Serviceberry Rocky Shrubland	3	1	
Black Spruce/Leatherleaf Semi-treed Bog	3	1	
Trembling Aspen-Balsam Poplar Lowland Forest	2	1	
TOTAL	257	104	
Geology / Soils	Granite-rich migmatite and Schist-rich migmatite.		
Water Resources	1.13 km of streams		
Flood Plain / Wetlands	82 acres (see above)		
Wildlife / Fisheries	None Known		
Threatened / Endangered / Sensitive Species	Animals	None Known	
	Plants	None Known	
Proposed Wilderness	Yes		
Park Facilities and Operations	None		

Name of the Unit: Meander Corner, 2003

Area: 52 ac (21 ha)

Type of Burn: Understory burn

Fuels: Timber – 120-year old white and red pine, and mixedwood – NFFL Fuel Models 9 and 8, CFFDRS Fuel Types C-5 and M-1.

General Descriptive Location: T 70N R 18W Sec. 31; north side of Mica Bay and Squirrel Narrows on Namakan Lake, directly north-northwest of Mica Island; boundaries are Namakan Lake to the south, a wet drainage to the east, and an old logging road along the northern perimeter.

Purpose of the Burn: Hazard fuel reduction to prevent a stand-replacement fire; also ecosystem management – replicate a natural, low-intensity fire that will kill hardwoods and brush competition and stimulate natural reproduction of white pine.

Vegetation Type	Acres	Hectares	
White Pine/Mountain Maple Mesic Forest	27	11	
White Pine-Red Pine-Quaking Aspen-Paper Birch Forest	7	3	
Boreal Pine Rocky Woodland (jack pine phase)	5	2	
Quaking Aspen-Paper Birch Forest	4	2	
Spruce-Fir-Aspen Forest	4	1	
Pin Oak-Bur Oak Rocky Woodland (mixed pine-oak phase)	2	1	
Trembling Aspen-Balsam Poplar Lowland Forest	2	1	
TOTAL	52	21	
Geology / Soils	Metasedimentary rocks, undivided - biotite-quartz-plagioclase schist and metagraywacke.		
Water Resources	None		
Flood Plain / Wetlands	None		
Wildlife / Fisheries	None Known		
Threatened / Endangered / Sensitive Species	Animals	None Known	
	Plants	None Known	
Proposed Wilderness	Yes		
Park Facilities and Operations	None		

Name of the Unit: Whispering Pines II, 2003

Area: 63 ac (25 ha)

Type of Burn: Understory burn

Fuels: Timber – red and white pine – NFFL Fuel Model 9, CFFDRS Fuel Type C-5.

General Descriptive Location: T 69N R 20W Sec. 25; just East of the Meadwood Road and south of the road to Whispering Pines housing area; elevation between 1150 and 1265 ft (350 and 385 m); slopes generally 2-3% on short ridges with northeast and southwest aspects.

Purpose of the Burn: Hazard fuels reduction, and ecosystem management – allowing fire to play its natural role as an ecosystem process.

Vegetation Type	Acres	Hectares	
White Pine-Red Pine-Quaking Aspen-Paper Birch Forest	30	12	
Quaking Aspen-Paper Birch Forest	11	4	
Red Pine/Blueberry Dry Forest	11	4	
White Pine/Mountain Maple Mesic Forest	9	4	
TOTAL	63	25	
Geology / Soils	Granite-rich migmatite and Schist-rich migamatite		
Water Resources	None		
Flood Plain / Wetlands	None		
Wildlife / Fisheries	None Known		
Threatened / Endangered / Sensitive Species	Animals	None Known	
	Plants	None Known	
Proposed Wilderness	No		
Park Facilities and Operations	None		

FY 2004

Name of the Unit: Rocky, 2004

Area: 628 ac (254 ha)

Type of Burn: Marsh Grass

Fuels: Grass, brush

General Descriptive Location: T 69N R 18W Sec. 34; north and east of Tooth Lake.

Purpose of the Burn: To rejuvenate and stimulate sprouting of decadent willow, to reduce herbaceous cover, to prevent build-up of debris, to reduce the invasion of woody vegetation (may require several burns), and to foster a change in albedo that permits earlier spring growth.

Vegetation Type	Acres	Hectares	
Wet Meadow/Fen Mosaic/Complex	140	57	
Leatherleaf Bog	78	31	
Northern Water Lily Aquatic Wetland	59	24	
Black Spruce/Leatherleaf Semi-treed Bog	47	19	
Speckled Alder Swamp	45	18	
Pin Oak-Bur Oak Rocky Woodland (mixed pine-oak phase)	33	13	
Canada Bluejoint Eastern Meadow	30	12	
Deep Marsh Mosaic/Complex	27	11	
Black Spruce/Labrador Tea Poor Swamp (evergreen phase)	25	10	
Boreal Pine Rocky Woodland (mixed pine phase)	25	10	
White Pine-Red Pine-Quaking Aspen-Paper Birch Forest	17	7	
Jack Pine-Aspen Forest Mosaic	16	6	
Beaver Basin Break-up Mosaic	13	5	
Quaking Aspen-Paper Birch Forest	12	5	
Jack Pine/Balsam Fir Forest	9	4	
Mixed Aspen Rocky Woodland	8	3	
Leatherleaf-Sweet Gale Shore Fen	7	3	
Boreal Pine Rocky Woodland (jack pine phase)	6	3	
Midwest Pondweed Submerged Aquatic Wetland	5	2	
Spruce-Fir/Mountain Maple Forest	4	2	
Spruce-Fir-Aspen Forest	4	2	
Northern Tamarack Rich Swamp	4	2	
Black Spruce/Alder Rich Swamp	2	1	
Boreal Hazelnut-Serviceberry Rocky Shrubland	2	1	
Water-Beaver Pond	2	1	
Black Ash-Mixed Hardwood Swamp	2	1	
TOTAL	628	254	
Geology / Soils	Lac La Croix Granite, Granite-rich migmatite, Schist-rich migamatite, Grasnitic leucogneiss		
Water Resources	2 acre beaver pond, 6.68 km of streams		
Flood Plain / Wetlands	434 acres (see above)		
Wildlife / Fisheries	None Known		
Threatened / Endangered / Sensitive Species	Animals	None Known	
	Plants	None Known	
Proposed Wilderness	Yes		
Park Facilities and Operations	None		

Name of the Unit: Daley Bay, 2004

Area: 173 ac (70 ha)

Type of Burn: Understory burn / stand replacement

Fuels: Timber – 60-70 year old jack pine / mixed conifers

Vegetation Type	Area, ac	Area, ha	Percent of Unit	NFFL Fuel Model	CFFDRS Fuel Type
Aspen-mixed conifer	29	12	17	2 / 8 *	D-1 / M-2 *
Jack pine	116	47	67	9	C-3
Red pine	3	1	2	9	C-5
Wetland marsh	24	10	14	3	O-1b

* 2 and D-1 for leaves absent condition; 8 and M-2 for leaves present condition

General Descriptive Location: T 69N R 29W Sec. 32; south-central portion of the Park, at the southeast end of Kabetogoma Lake near Daley Bay, east of Daley Brook, approximately 1.0 mi (1.6 km) northwest of the Park boundary; boundaries are wetlands on the north, west, and south sides and an old winter road on the east side; elevation ranges from 1120 to 1260 ft (340 to 415 m) with mostly 10% slopes on a dominant east-west ridge.

Purpose of the Burn: Hazard fuel reduction; also, ecosystem management – replicate a natural, low-intensity fire in this fire-adapted ecosystem.

Vegetation Type	Acres	Hectares	
Quaking Aspen-Paper Birch Forest	88	31	
Boreal Pine Rocky Woodland (jack pine phase)	28	11	
Mixed Aspen Rocky Woodland	13	5	
Speckled Alder Swamp	9	4	
Trembling Aspen-Balsam Poplar Lowland Forest	9	4	
Boreal Pine Rocky Woodland (mixed pine phase)	8	3	
Dogwood-Pussy Willow Swamp	7	3	
Jack Pine/Lichen Rocky Barrens	6	3	
Pin Oak-Bur Oak Rocky Woodland (mixed pine-oak phase)	6	2	
Spruce-Fir-Aspen Forest	4	2	
White Cedar-Black Ash Swamp	3	1	
Black Ash-Mixed Hardwood Swamp	3	1	
White Cedar-Yellow Birch Forest	1	0	
TOTAL	173	70	
Geology / Soils	Lac La Croix granite - biotite granite.		
Water Resources	None		
Flood Plain / Wetlands	31 acres (see above)		
Wildlife / Fisheries	None Known		
Threatened / Endangered / Sensitive Species	Animals	None Known	
	Plants	None Known	
Proposed Wilderness	Yes		
Park Facilities and Operations	None		

Name of the Unit: Ryan Lake North, 2004

Area: 571 ac (231 ha)

Type of Burn: Understory burn

Fuels: Timber – 120-year old white and red pine, and mixedwood – NFFL Fuel Models 9 and 8, CFFDRS Fuel Types C-5 and M-1.

General Descriptive Location: T 70N R19W Sec. 25; north side of Mica Bay and Squirrel Narrows on Namakan Lake, directly north-northwest of Mica Island; boundaries are drainages to the east and northeast, wet cedar stands on the south and west sides, and a brushed line to connect Ryan Lake with wetlands to the east on the northern perimeter.

Purpose of the Burn: Hazard fuel reduction to prevent a stand-replacement fire; also ecosystem management – replicate a natural, low-intensity fire that will kill hardwoods and brush competition and stimulate natural reproduction of white pine.

Vegetation Type	Acres	Hectares	
White Pine-Red Pine-Quaking Aspen-Paper Birch Forest	171	69	
Quaking Aspen-Paper Birch Forest	129	52	
Spruce-Fir-Aspen Forest	63	26	
White Pine/Mountain Maple Mesic Forest	53	21	
Jack Pine/Balsam Fir Forest	27	11	
Wet Meadow/Fen Mosaic/Complex	23	9	
Deep Marsh Mosaic/Complex	23	9	
Red Pine/Blueberry Dry Forest	17	7	
Black Spruce/Alder Rich Swamp	10	4	
Northern Water Lily Aquatic Wetland	8	3	
Spruce-Fir/Mountain Maple Forest	7	3	
Boreal Pine Rocky Woodland (jack pine phase)	6	2	
Black Spruce/Labrador Tea Poor Swamp (evergreen phase)	6	2	
Speckled Alder Swamp	5	2	
Boreal Pine Rocky Woodland (mixed pine phase)	5	2	
Trembling Aspen-Balsam Poplar Lowland Forest	3	1	
Jack Pine-Aspen Forest Mosaic	3	1	
Pin Oak-Bur Oak Rocky Woodland (mixed pine-oak phase)	3	1	
Leatherleaf Bog	2	1	
Black Ash-Mixed Hardwood Swamp	1	1	
TOTAL	571	231	
Geology / Soils	Metasedimentary rocks, undivided - biotite-quartz-plagioclase schist and metagraywacke.		
Water Resources	1 acre pond, 0.73 km of streams		
Flood Plain / Wetlands	82 acres (see above)		
Wildlife / Fisheries	None Known		
Threatened / Endangered / Sensitive Species	Animals	None Known	
	Plants	lichen	
Proposed Wilderness	Yes		
Park Facilities and Operations	None		

Name of the Unit: North Rottenwood, 2004

Area: 230 ac (93 ha)

Type of Burn: Understory burn

Fuels: Timber.

General Descriptive Location: T 70N R 21W Sec. 19

Purpose of the Burn: Hazard fuel reduction.

Vegetation Type	Acres	Hectares	
Spruce-Fir-Aspen Forest	71	29	
Quaking Aspen-Paper Birch Forest	58	23	
White Pine-Red Pine-Quaking Aspen-Paper Birch Forest	54	22	
White Pine/Mountain Maple Mesic Forest	17	7	
Black Ash-Mixed Hardwood Swamp	9	3	
Northern Bur Oak Mesic Forest	6	3	
Spruce-Fir/Mountain Maple Forest	5	2	
Wet Meadow/Fen Mosaic/Complex	4	2	
Trembling Aspen-Balsam Poplar Lowland Forest	3	1	
Northern Tamarack Rich Swamp	2	1	
Boreal Pine Rocky Woodland (mixed pine phase)	1	0	
TOTAL	230	93	
Geology / Soils	Metasedimentary rocks, undivided - biotite-quartz-plagioclase schist and metagraywacke.		
Water Resources	None		
Flood Plain / Wetlands	14 acres (see above)		
Wildlife / Fisheries	None Known		
Threatened / Endangered / Sensitive Species	Animals	Eagle nest	
	Plants	None Known	
Proposed Wilderness	Yes		
Park Facilities and Operations	2 campsites		

Name of the Unit: Whispering Pines III, 2004

Area: 43 ac (17 ha)

Type of Burn: Understory burn

Fuels: Timber – red and white pine – NFFL Fuel Model 9, CFFDRS Fuel Type C-5.

General Descriptive Location: T 69N R 20W Sec. 25; just south of Whispering Pines II, south of the road to the Whispering Pines housing area, and east of Meadwood Road; elevation between 1150 and 1265 ft (350 and 385 m); slopes generally 2-3% on short ridges with northeast and southwest aspects.

Purpose of the Burn: Hazard fuels reduction, and ecosystem management – allowing fire to play its natural role as an ecosystem process.

Vegetation Type	Acres	Hectares	
White Pine/Mountain Maple Mesic Forest	21	9	
White Pine-Red Pine-Quaking Aspen-Paper Birch Forest	8	3	
Red Pine/Blueberry Dry Forest	8	3	
Boreal Hazelnut-Serviceberry Rocky Shrubland	3	1	
Trembling Aspen-Balsam Poplar Lowland Forest	2	1	
TOTAL	43	17	
Geology / Soils	Granite-rich migmatite		
Water Resources	None		
Flood Plain / Wetlands	None		
Wildlife / Fisheries	None Known		
Threatened / Endangered / Sensitive Species	Animals	None Known	
	Plants	None Known	
Proposed Wilderness	No		
Park Facilities and Operations	None		

FY 2005

Name of the Unit: Frostbite, 2005

Area: 470 ac (190 ha)

Type of Burn: Marsh Grass

Fuels: Grass, brush.

General Descriptive Location: T 70N R 22W Sec. 25, 30, 36 and T69N R 22W Sec. 1,2,11; Tom Cod Bay; elevation 1,125 ft (343 m).

Purpose of the Burn: To rejuvenate decadent willow and stimulate sprouting of willow species, to reduce annuals and dead herbaceous cover, to prevent build-up of debris on the marsh floor, to reduce the invasion of woody vegetation into this marsh ecosystem (may require several burns), and to foster a change in albedo that permits earlier spring growth.

Vegetation Type	Acres	Hectares	
Black Spruce/Leatherleaf Semi-treed Bog	150	60	
Wet Meadow/Fen Mosaic/Complex	81	33	
Leatherleaf-Sweet Gale Shore Fen	68	28	
Dogwood-Pussy Willow Swamp	59	24	
Speckled Alder Swamp	34	14	
Northern Tamarack Rich Swamp	24	10	
Deep Marsh Mosaic/Complex	15	6	
Bog Birch-Willow Shore Fen	8	3	
Leatherleaf Bog	6	3	
Black Spruce/Labrador Tea Poor Swamp (evergreen phase)	6	2	
Midwest Cattail Deep Marsh	4	2	
Black Spruce/Labrador Tea Poor Swamp (mixed phase)	3	1	
Quaking Aspen-Paper Birch Forest	3	1	
Black Spruce/Alder Rich Swamp	1	1	
Small Island with Shrubs	1	0	
Wild Rice Marsh	1	0	
Trembling Aspen-Balsam Poplar Lowland Forest	1	0	
TOTAL	470	190	
Geology / Soils Metasedimentary rocks, undivided - biotite-quartz-plagioclase schist and metagraywacke.			
Water Resources None			
Flood Plain / Wetlands 470 acres (see above)			
Wildlife / Fisheries None Known			
Threatened / Endangered / Sensitive Species	Animals	None Known	
	Plants	None Known	
Proposed Wilderness Yes			
Park Facilities and Operations None			

Name of the Unit: East Daley (Brook) II, 2005

Area: 56 ac (23 ha)

Type of Burn: Understory burn

Fuels: Timber – 60-70 year old red pine, jack pine, and mixed conifer stands

<i>Vegetation</i> Type	Area, ac	Area, ha	Percent of Unit	NFFL Fuel Model	CFFDRS Fuel Type
Aspen-mixed conifer	25	10	44	2 / 8 *	D-1 / M-2 *
Jack pine	26	11	47	9	C-3
Red pine	5	2	9	9	C-5

* 2 and D-1 for leaves absent condition; 8 and M-2 for leaves present condition

General Descriptive Location: T 69N R 20W Sec. 32; south-central portion of the Park, near Daley Bay on the east end of Kabetogama Lake, approximately 1.0 mi (1.6 km) north of the Park boundary; all boundaries are wetland brush and swamp conifers; elevation ranges from 1120 to 1175 ft (341 to 358 m) with mostly 10% slopes on east and west aspects. Note: the Unit is divided into Sub-units 1, 2, and 3.

Purpose of the Burn: Hazard fuel reduction; also, ecosystem management – replicate a natural, low-intensity fire in this fire-adapted ecosystem.

Vegetation Type	Acres	Hectares	
Quaking Aspen-Paper Birch Forest	22	9	
Trembling Aspen-Balsam Poplar Lowland Forest	10	4	
White Pine-Red Pine-Quaking Aspen-Paper Birch Forest	9	4	
Boreal Pine Rocky Woodland (jack pine phase)	7	3	
Jack Pine-Aspen Forest Mosaic	6	2	
Boreal Pine Rocky Woodland (mixed pine phase)	1	0	
Black Ash-Mixed Hardwood Swamp	1	0	
Speckled Alder Swamp	1	0	
TOTAL	56	23	
Geology / Soils Lac La Croix granite - biotite granite.			
Water Resources None			
Flood Plain / Wetlands 12 acres (see above)			
Wildlife / Fisheries None Known			
Threatened / Endangered / Sensitive Species	Animals	None Known	
	Plants	None Known	
Proposed Wilderness Yes			
Park Facilities and Operations None			

Name of the Unit: Fennwick, 2005

Area: 1,083 ac (438 ha)

Type of Burn: Stand replacement

Fuels: Timber – jack pine – NFFL Fuel Model 9, CFFDRS Fuel Type C-3.

General Descriptive Location: T 70N R 21W Sec. 22

Purpose of the Burn: Jack pine stand replacement

Vegetation Type	Acres	Hectares	
Quaking Aspen-Paper Birch Forest	261	106	
Jack Pine/Balsam Fir Forest	209	84	
Spruce-Fir-Aspen Forest	142	57	
Jack Pine-Aspen Forest Mosaic	101	41	
Wet Meadow/Fen Mosaic/Complex	95	39	
Black Spruce/Feathermoss Forest	78	32	
Speckled Alder Swamp	43	18	
Deep Marsh Mosaic/Complex	39	16	
Black Spruce/Alder Rich Swamp	23	9	
Black Spruce/Labrador Tea Poor Swamp (evergreen phase)	21	8	
Spruce-Fir/Mountain Maple Forest	2	8	
Boreal Pine Rocky Woodland (jack pine phase)	12	5	
Black Spruce/Leatherleaf Semi-treed Bog	10	4	
Black Ash-Mixed Hardwood Swamp	7	3	
Black Spruce/Labrador Tea Poor Swamp (mixed phase)	7	3	
Leatherleaf-Sweet Gale Shore Fen	4	1	
Northern Water Lily Aquatic Wetland	3	1	
Boreal Pine Rocky Woodland (mixed pine phase)	3	1	
Canada Bluejoint Eastern Meadow	2	1	
White Cedar-(Mixed Conifer)/Alder Swamp (rich soil phase)	2	1	
Northern Tamarack Rich Swamp	1	0	
TOTAL	1083	438	
Geology / Soils Metasedimentary rocks, undivided - biotite-quartz-plagioclase schist and metagraywacke.			
Water Resources 2.39 km of streams			
Flood Plain / Wetlands 334 acres (see above)			
Wildlife / Fisheries None Known			
Threatened / Endangered / Sensitive Species		Animals	None Known
		Plants	None Known
Proposed Wilderness Yes			
Park Facilities and Operations None			

Name of the Unit: Whispering Pines IV, 2005

Area: 49 ac (20 ha)

Type of Burn: Understory burn

Fuels: Timber – red and white pine – NFFL Fuel Model 9, CFFDRS Fuel Type C-5.

General Descriptive Location: T 69N R 20W Sec. 25; just east of Whispering Pines III, south of the road to the Whispering Pines housing area and east of Meadwood Road, and east of Sullivan Bay; elevation between 1150 and 1265 ft (350 and 385 m); slopes generally 2-3% on short ridges with northeast and southwest aspects.

Purpose of the Burn: Hazard fuels reduction, and ecosystem management – allowing fire to play its natural role as an ecosystem process.

Vegetation Type	Acres	Hectares	
White Pine-Red Pine-Quaking Aspen-Paper Birch Forest	36	15	
Black Spruce/Feathermoss Forest	5	2	
Quaking Aspen-Paper Birch Forest	3	1	
Red Pine/Blueberry Dry Forest	3	1	
Boreal Pine Rocky Woodland (mixed pine phase)	1	0	
Spruce-Fir-Aspen Forest	1	0	
TOTAL	49	20	
Geology / Soils Granite-rich migmatite			
Water Resources None			
Flood Plain / Wetlands 5 acres (see above)			
Wildlife / Fisheries None Known			
Threatened / Endangered / Sensitive Species	Animals	None Known	
	Plants	None Known	
Proposed Wilderness No			
Park Facilities and Operations None			

FY 2006

Name of the Unit: Whiplash, 2006

Area: 618 ac (250 ha)

Type of Burn: Marsh grass

Fuels: Grass, brush.

General Descriptive Location: T 68N R 20W Sec. 5; Daley Brook, Daley Bay, Moxie Island.

Purpose of the Burn: To rejuvenate decadent willow and stimulate sprouting of willow species, to reduce annuals and dead herbaceous cover, to prevent build-up of debris on the marsh floor, to reduce the invasion of woody vegetation into this marsh ecosystem (may require several burns), and to foster a change in albedo that permits earlier spring growth.

Vegetation Type	Acres	Hectares	
Wet Meadow/Fen Mosaic/Complex	250	101	
Trembling Aspen-Balsam Poplar Lowland Forest	18	7	
Spruce-Fir-Aspen Forest	3	1	
Speckled Alder Swamp	22	9	
Quaking Aspen-Paper Birch Forest	7	3	
Midwest Pondweed Submerged Aquatic Wetland	3	1	
Midwest Cattail Deep Marsh	22	9	
Leatherleaf Bog	3	1	
Dogwood-Pussy Willow Swamp	234	95	
Deep Marsh Mosaic/Complex	42	17	
Boreal Pine Rocky Woodland (mixed pine phase)	4	2	
Boreal Hazelnut-Serviceberry Rocky Shrubland	1	0	
Black Ash-Mixed Hardwood Swamp	2	1	
TOTAL	618	250	
Geology / Soils Lac La Croix granite - biotite granite.			
Water Resources None			
Flood Plain / Wetlands 597 acres (see above)			
Wildlife / Fisheries None Known			
Threatened / Endangered / Sensitive Species	Animals	None Known	
	Plants	None Known	
Proposed Wilderness Yes			
Park Facilities and Operations None			

Name of the Unit: Maelstrom, 2006

Area: 1,265 ac (512 ha)

Type of Burn: Stand replacement

Fuels: Timber – jack pine – NFFL Fuel Model 9, CFFDRS Fuel Type C-3.

General Descriptive Location: T 69N R 19W Sec. 9.

Purpose of the Burn: Jack pine stand replacement.

VegetationType	Acres	Hectares	
Jack Pine-Aspen Forest Mosaic	344	139	
Quaking Aspen-Paper Birch Forest	253	102	
Jack Pine/Balsam Fir Forest	215	87	
Spruce-Fir-Aspen Forest	87	35	
Speckled Alder Swamp	51	21	
Boreal Pine Rocky Woodland (jack pine phase)	46	19	
Wet Meadow/Fen Mosaic/Complex	44	18	
Deep Marsh Mosaic/Complex	43	17	
White Pine-Red Pine-Quaking Aspen-Paper Birch Forest	33	13	
Black Spruce/Labrador Tea Poor Swamp (evergreen phase)	19	8	
Mixed Aspen Rocky Woodland	18	7	
Leatherleaf Bog	17	7	
Midwest Pondweed Submerged Aquatic Wetland	13	5	
Northern Water Lily Aquatic Wetland	10	4	
Black Spruce/Leatherleaf Semi-treed Bog	9	4	
Boreal Pine Rocky Woodland (mixed pine phase)	9	3	
Northern Tamarack Rich Swamp	8	3	
Black Spruce/Alder Rich Swamp	7	3	
Pin Oak-Bur Oak Rocky Woodland (mixed pine-oak phase)	6	3	
White Cedar-Yellow Birch Forest	5	2	
Boreal Hazelnut-Serviceberry Rocky Shrubland	4	2	
Spruce-Fir/Mountain Maple Forest	3	1	
Black Spruce/Labrador Tea Poor Swamp (mixed phase)	2	1	
Red Pine/Blueberry Dry Forest	2	1	
White Cedar-Boreal Conifer Mesic Forest	1	1	
Small Island with Trees	1	0	
Canada Bluejoint Eastern Meadow	1	0	
TOTAL	1265	512	
Geology / Soils	Mainly Schist-rich migamatite with Metasedimentary rocks		
Water Resources	3.28 km of streams		
Flood Plain / Wetlands	230 acres (see above)		
Wildlife / Fisheries	None Known		
Threatened / Endangered / Sensitive Species	Animals	1 Osprey nest	
	Plants	None Known	
Proposed Wilderness	Yes		
Park Facilities and Operations	None		

Name of the Unit: Whispering Pines V, 2006

Area: 77 ac (31 ha)

Type of Burn: Understory burn

Fuels: Timber – red and white pine – NFFL Fuel Model 9, CFFDRS Fuel Type C-5.

General Descriptive Location: T 69N R 20W Sec. 25; north and northeast of Whispering Pines III and IV, south of the road to the Whispering Pines housing area and east of Meadwood Road and Sullivan Bay; elevation between 1150 and 1265 ft (350 and 385 m); slopes generally 2-3% on short ridges with northeast and southwest aspects.

Purpose of the Burn: Hazard fuels reduction, and ecosystem management – allowing fire to play its natural role as an ecosystem process.

Vegetation Type	Acres	Hectares	
White Pine-Red Pine-Quaking Aspen-Paper Birch Forest	45	18	
Spruce-Fir-Aspen Forest	18	7	
Quaking Aspen-Paper Birch Forest	7	3	
Red Pine/Blueberry Dry Forest	3	1	
Speckled Alder Swamp	2	1	
Spruce-Fir/Mountain Maple Forest	2	1	
Trembling Aspen-Balsam Poplar Lowland Forest	1	0	
TOTAL	77	31	
Geology / Soils	Granite-rich migmatite and Schist-rich migamatite		
Water Resources	None		
Flood Plain / Wetlands	2 acres (see above)		
Wildlife / Fisheries	None Known		
Threatened / Endangered / Sensitive Species	Animals	None Known	
	Plants	None Known	
Proposed Wilderness	No		
Park Facilities and Operations	Seasonal Housing - 11 units		

Name of the Unit: Whispering Pines VI, 2006

Area: 14 ac (6 ha)

Type of Burn: Understory burn

Fuels: Timber – red and white pine – NFFL Fuel Model 9, CFFDRS Fuel Type C-5.

General Descriptive Location: T 69N R 20W Sec. 25; southeast of Whispering Pines I, south of the Ash River Visitor Center, west of Meadwood Road and across the road from Whispering Pines II and III; elevation between 1150 and 1265 ft (350 and 385 m); slopes generally 2-3% on short ridges with northeast and southwest aspects.

Purpose of the Burn: Hazard fuels reduction, and ecosystem management – allowing fire to play its natural role as an ecosystem process.

Vegetation Type	Acres	Hectares	
White Pine/Mountain Maple Mesic Forest	7	3	
Quaking Aspen-Paper Birch Forest	5	2	
Black Ash-Mixed Hardwood Swamp	1	1	
TOTAL	14	6	
Geology / Soils	Granite-rich migmatite		
Water Resources	0.17 km of streams		
Flood Plain / Wetlands	2 acres (see above)		
Wildlife / Fisheries	None Known		
Threatened / Endangered / Sensitive Species	Animals	None Known	
	Plants	None Known	
Proposed Wilderness	No		
Park Facilities and Operations	None		

Alternate Burn Units

Name of the Unit: Blind Ash Bay (Alternate, Potential Fire Re-entry)

Area: 333 ac (135 ha)

Type of Burn: Understory burn

Fuels: Mixed Pine – NFFL Fuel Model 9, CFFDRS Fuel Type C-5.

General Descriptive Location: T 69N R 20W Sec. 25, 26, 35, 36; east end of Lake Kabetogama on the west end of Kabetogama Narrows; 1.5 mi (2.4 km) long in a northwest-to-southeast direction and 0.5 mi (0.8 km) wide; northern boundary is Lake Kabetogama, a portion of the western is Blind Ash Bay, the southwestern is a wetland containing several beaver ponds, and the eastern is the Meadwood Road and the service road into the Ash River maintenance area; 0.75 mi (1.2 km) north of the park boundary.

Purpose of the Burn: Hazard fuels reduction, promotion of pine regeneration, and ecosystem management – allowing fire to play its natural role as an ecosystem process.

Vegetation Type	Acres	Hectares	
White Pine-Red Pine-Quaking Aspen-Paper Birch Forest	115	47	
Quaking Aspen-Paper Birch Forest	33	13	
Red Pine/Blueberry Dry Forest	24	10	
White Pine/Mountain Maple Mesic Forest	23	9	
Spruce-Fir-Aspen Forest	19	8	
Wet Meadow/Fen Mosaic/Complex	17	7	
Spruce-Fir/Mountain Maple Forest	16	6	
Trembling Aspen-Balsam Poplar Lowland Forest	16	6	
Boreal Pine Rocky Woodland (mixed pine phase)	13	5	
Black Spruce/Feathermoss Forest	9	4	
Northern Water Lily Aquatic Wetland	9	3	
Speckled Alder Swamp	8	3	
Black Ash-Mixed Hardwood Swamp	7	3	
Canada Bluejoint Eastern Meadow	6	2	
Deep Marsh Mosaic/Complex	5	2	
Leatherleaf Bog	4	2	
Boreal Pine Rocky Woodland (jack pine phase)	2	1	
Poverty Grass Granite Barrens	2	1	
Northern Tamarack Rich Swamp	1	0	
TOTAL	333	135	
Geology / Soils	Granite-rich migmatite, Schist-rich migmatite, and Lac La Croix granite		
Water Resources	None		
Flood Plain / Wetlands	66 acres (see above)		
Wildlife / Fisheries	None Known		
Threatened / Endangered / Sensitive Species	Animals	None Known	
	Plants	None Known	
Proposed Wilderness	No		
Park Facilities and Operations	None		

Name of the Unit: Moose Bay (Alternate, Potential Fire Re-entry)

Area: 235 ac (95 ha)

Type of Burn: Understory burn

Fuels: Mixed jack, red, and white pine – NFFL Fuel Model 9,8, CFFDRS Fuel Type C-3, M-2.

General Descriptive Location: T 69N R 19W Sec. 26,27,34; near the southwestern end of Namakan Lake, on a peninsula between Moose Bay and Hoist Bay; about 1.0 mi (1.6 km) long in a north-to-south direction, about 0.75 mi (1.2 km) wide, and $\frac{3}{4}$ surrounded by water; an early 1900s railroad grade and road is the southern control line and unit boundary; approximately 2 mi (3.2 km) east of the community of Ash River and about 1 mi (1.6 km) north of the park boundary.

Purpose of the Burn: Hazard fuels reduction, promotion of pine regeneration, and ecosystem management – allowing fire to play its natural role as an ecosystem process.

Vegetation Type	Acres	Hectares	
Jack Pine-Aspen Forest Mosaic	47	19	
Jack Pine/Balsam Fir Forest	46	19	
Quaking Aspen-Paper Birch Forest	45	18	
White Pine-Red Pine-Quaking Aspen-Paper Birch Forest	33	13	
Boreal Pine Rocky Woodland (jack pine phase)	27	11	
Leatherleaf Bog	12	5	
Mixed Aspen Rocky Woodland	5	2	
Spruce-Fir-Aspen Forest	5	2	
Pin Oak-Bur Oak Rocky Woodland (mixed pine-oak phase)	3	1	
Deep Marsh Mosaic/Complex	3	1	
Boreal Hazelnut-Serviceberry Rocky Shrubland	2	1	
Boreal Pine Rocky Woodland (mixed pine phase)	2	1	
Black Spruce/Leatherleaf Semi-treed Bog	2	1	
Black Spruce/Feathermoss Forest	2	1	
Trembling Aspen-Balsam Poplar Lowland Forest	1	0	
TOTAL	235	95	
Geology / Soils Mainly Schist-rich migmatite with Granite-rich migmatite			
Water Resources None			
Flood Plain / Wetlands 21 acres (see above)			
Wildlife / Fisheries None Known			
Threatened / Endangered / Sensitive Species	Animals	None Known	
	Plants	None Known	
Proposed Wilderness No			
Park Facilities and Operations None			

Name of the Unit: Mica Bay (Alternate, Potential Fire Re-entry)

Area: 23 ac (9 ha)

Type of Burn: Understory burn

Fuels: Mixed red and white pine – NFFL Fuel Model 9 CFFDRS Fuel Type C-5.

General Descriptive Location: T 70N R 18W Sec. 31; on the eastern end of Mica Bay at the northern end of Namakan Lake; bordered by natural barriers on three sides: to the west a drainage flows south to Namakan Lake, to the north is a flooded wetland, to the south is Mica Bay, and to the east is a depression which runs north- south connecting the flooded wetland with Mica Bay; approximately 0.75 mi (1.2 km) south of the park boundary.

Purpose of the Burn: Hazard fuels reduction, promotion of pine regeneration, and ecosystem management – allowing fire to play its natural role as an ecosystem process.

Vegetation Type	Acres	Hectares	
White Pine/Mountain Maple Mesic Forest	18	7	
White Pine-Red Pine-Quaking Aspen-Paper Birch Forest	4	2	
Beaver Basin Break-up Mosaic	1	0	
TOTAL	23	9	
Geology / Soils Metasedimentary rocks, undivided - biotite-quartz-plagioclase schist and metagraywacke.			
Water Resources None			
Flood Plain / Wetlands 1 acre (see above)			
Wildlife / Fisheries None Known			
Threatened / Endangered / Sensitive Species	Animals	None Known	
	Plants	None Known	
Proposed Wilderness No			
Park Facilities and Operations None			

Name of the Unit: Willow (Alternate, Potential Fire Re-entry)

Area: 40 ac (16 ha)

Type of Burn: Grass/Brush burn

Fuels: Grass/Brush – NFFL Fuel Model 3 CFFDRS Fuel Type 0-1b.

General Descriptive Location: T 68N R 20W Sec. 2; on the south side of Kabetogama Lake along the east side of Daley Brook; approximately 1.2 mi (1.9 km) long in a north-to-south direction and averaging about 300 feet wide; bordered by water on the western side and by hardwood forest (aspen and swamp hardwoods) on the eastern side; approximately 0.6 mi (1.0 km) south of the park boundary.

Purpose of the Burn: To rejuvenate decadent willow and stimulate sprouting of willow species, to reduce annuals and dead herbaceous cover, to prevent build-up of debris on the marsh floor, to reduce the invasion of woody vegetation into this marsh ecosystem (may require multiple burns), and to foster a change in albedo that permits earlier spring growth.

Vegetation Type	Acres	Hectares	
Dogwood-Pussy Willow Swamp	11	5	
Trembling Aspen-Balsam Poplar Lowland Forest	9	4	
Deep Marsh Mosaic/Complex	7	3	
Quaking Aspen-Paper Birch Forest	4	2	
Eastern Reed Marsh	2	1	
Wet Meadow/Fen Mosaic/Complex	2	1	
Mixed Aspen Rocky Woodland	2	1	
Speckled Alder Swamp	2	1	
TOTAL	40	16	
Geology / Soils Lac La Croix granite			
Water Resources None			
Flood Plain / Wetlands 34 acres (see above)			
Wildlife / Fisheries None Known			
Threatened / Endangered / Sensitive Species	Animals	None Known	
	Plants	None Known	
Proposed Wilderness No			
Park Facilities and Operations None			

Name of the Unit: Daley Brook West (Alternate, Potential Fire Re-entry)

Area: 48 ac (19 ha)

Type of Burn: Grass/Brush burn

Fuels: Grass/Brush – NFFL Fuel Model 3, CFFDRS Fuel Type 0-1b.

General Descriptive Location: T 69N R 20W Sec. 31 on the south side of Kabetogama Lake and along the west side of Daley Brook; approximately 0.75 mi (1.2 km) long in a north-to-south direction and averaging 100 feet wide; bordered by Daley Brook on the eastern side and hardwood forest on the western and southern sides; 0.5 mi (0.8 km) north of the park boundary.

Purpose of the Burn: To rejuvenate decadent willow and stimulate sprouting of willow species, to reduce annuals and dead herbaceous cover, to prevent build-up of debris on the marsh floor, to reduce the invasion of woody vegetation into this marsh ecosystem (may require multiple burns), and to foster a change in albedo that permits earlier spring growth

Vegetation Type	Acres	Hectares	
Dogwood-Pussy Willow Swamp	20	8	
Wet Meadow/Fen Mosaic/Complex	8	3	
Trembling Aspen-Balsam Poplar Lowland Forest	8	3	
Quaking Aspen-Paper Birch Forest	3	1	
Spruce-Fir-Aspen Forest	3	1	
Boreal Pine Rocky Woodland (mixed pine phase)	2	1	
Deep Marsh Mosaic/Complex	2	1	
TOTAL	48	19	
Geology / Soils Lac La Croix granite			
Water Resources None			
Flood Plain / Wetlands 31 acres (see above)			
Wildlife / Fisheries None Known			
Threatened / Endangered / Sensitive Species	Animals	None Known	
	Plants	None Known	
Proposed Wilderness No			
Park Facilities and Operations None			

Name of the Unit: Randolph Bay (Alternate)

Area: 436 ac (177 ha)

Type of Burn: Understory burn

Fuels: Timber – 100-120 year old white pine, and mixedwood – NFFL Fuel Models 8 and 9, CFFDRS Fuel Types C-5 and M-1.

General Descriptive Location: T 69N R 18W Sec. 28; south of Randolph Bay between Namakan Lake and Johnson Lake.

Purpose of the Burn: Hazard fuel reduction to prevent a stand-replacement fire; also, ecosystem management – replicate a natural, low-intensity surface fire that will kill hardwoods and brush regeneration and stimulate regeneration of white pine.

Vegetation Type	Acres	Hectares	
Boreal Pine Rocky Woodland (mixed pine phase)	87	35	
Quaking Aspen-Paper Birch Forest	69	28	
Spruce-Fir-Aspen Forest	68	27	
White Pine-Red Pine-Quaking Aspen-Paper Birch Forest	44	18	
Jack Pine-Aspen Forest Mosaic	28	11	
Wet Meadow/Fen Mosaic/Complex	22	9	
Mixed Aspen Rocky Woodland	20	8	
Speckled Alder Swamp	18	7	
Leatherleaf Bog	18	7	
Northern Water Lily Aquatic Wetland	8	3	
Black Spruce/Leatherleaf Semi-treed Bog	7	3	
Black Spruce/Feathermoss Forest	7	3	
Deep Marsh Mosaic/Complex	7	3	
White Pine/Mountain Maple Mesic Forest	6	3	
Canada Bluejoint Eastern Meadow	5	2	
Pin Oak-Bur Oak Rocky Woodland (mixed pine-oak phase)	4	2	
Boreal Pine Rocky Woodland (jack pine phase)	4	1	
Jack Pine/Balsam Fir Forest	3	1	
Midwest Pondweed Submerged Aquatic Wetland	3	1	
Spruce-Fir/Mountain Maple Forest	3	1	
Boreal Hazelnut-Serviceberry Rocky Shrubland	1	0	
TOTAL	436	177	
Geology / Soils Mainly Granite-rich migmatite with Schist-rich migmatite			
Water Resources None			
Flood Plain / Wetlands 98 acres (see above)			
Wildlife / Fisheries None Known			
Threatened / Endangered / Sensitive Species		Animals	None Known
		Plants	None Known
Proposed Wilderness Yes			
Park Facilities and Operations 1 campsite			

Name of the Unit: Net Lake West (Alternate)

Area: 96 ac (39 ha)

Type of Burn: Understory burn

Fuels: Timber – white and red pine, and mixedwood – NFFL Fuel Models 9 and 8, CFFDRS Fuel Types C-5 and M-1.

General Descriptive Location: T 68N R 18W Sec. 4; near Net Lake and Tooth Lake.

Purpose of the Burn: Hazard fuel reduction; also, ecosystem management – replicate a natural, low-intensity fire in this fire-adapted ecosystem.

Vegetation Type	Acres	Hectares	
Spruce-Fir-Aspen Forest	29	12	
White Cedar-Boreal Conifer Mesic Forest	15	6	
Leatherleaf-Sweet Gale Shore Fen	12	5	
Spruce-Fir/Mountain Maple Forest	11	5	
Canada Bluejoint Eastern Meadow	11	4	
Wet Meadow/Fen Mosaic/Complex	7	3	
White Pine-Red Pine-Quaking Aspen-Paper Birch Forest	5	2	
Speckled Alder Swamp	2	1	
Jack Pine/Balsam Fir Forest	2	1	
TOTAL	96	39	
Geology / Soils Mainly Schist-rich migamatite with Granite-rich migmatite			
Water Resources None			
Flood Plain / Wetlands 32 acres (see above)			
Wildlife / Fisheries None Known			
Threatened / Endangered / Sensitive Species	Animals	None Known	
	Plants	None Known	
Proposed Wilderness Yes			
Park Facilities and Operations None			

Name of the Unit: Wiyapka (Alternate)

Area: 652 ac (264 ha)

Type of Burn: Understory burn

Fuels: Timber – 60-70 year old white pine

Vegetation Type	Area, ac	Area, ha	Percent of Unit	NFFL Fuel Model	CFFDRS Fuel Type
Aspen-birch	143	58	22	2 / 8	D-1 / M-2
Spruce-fir	92	37	14	10	C-2
White pine	170	69	26	9	C-5
Lowland shrub	234	95	36	3	O-1b

General Descriptive Location: T 68N R 18W Sec. 5; 0.5 mi (0.8 km) southwest of Junction Bay; the boundary is Wiyapka Lake and wetland drainages; elevation ranges from 1150 to 1280 ft (350 to 390 m) with rolling, mostly 10% slopes on north / south aspects and no major ridges.

Purpose of the Burn: Hazard fuel reduction.

Vegetation Type	Acres	Hectares	
White Pine-Red Pine-Quaking Aspen-Paper Birch Forest	168	68	
Spruce-Fir-Aspen Forest	106	43	
Wet Meadow/Fen Mosaic/Complex	98	40	
Spruce-Fir/Mountain Maple Forest	42	17	
Quaking Aspen-Paper Birch Forest	34	15	
Deep Marsh Mosaic/Complex	31	12	
Leatherleaf Bog	27	11	
Pin Oak-Bur Oak Rocky Woodland (mixed pine-oak phase)	26	11	
Northern Water Lily Aquatic Wetland	23	9	
Black Spruce/Labrador Tea Poor Swamp (mixed phase)	15	6	
Canada Bluejoint Eastern Meadow	14	6	
Mixed Aspen Rocky Woodland	13	5	
Northern Tamarack Rich Swamp	11	4	
Boreal Pine Rocky Woodland (mixed pine phase)	8	3	
Black Ash-Mixed Hardwood Swamp	8	3	
Speckled Alder Swamp	7	3	
Black Spruce/Leatherleaf Semi-treed Bog	6	2	
White Pine/Mountain Maple Mesic Forest	5	2	
Boreal Pine Rocky Woodland (jack pine phase)	4	2	
Boreal Hazelnut-Serviceberry Rocky Shrubland	4	2	
TOTAL	652	264	
Geology / Soils	Granite-rich migmatite and Schist-rich migmatite		
Water Resources	None		
Flood Plain / Wetlands	254 acres (see above)		
Wildlife / Fisheries	None Known		
Threatened / Endangered / Sensitive Species	Animals	None Known	
	Plants	None Known	
Proposed Wilderness	Yes		
Park Facilities and Operations	None		

Name of the Unit: Junction Bay West (Alternate)

Area: 264 ac (107 ha)

Type of Burn: Understory burn

Fuels: Timber – mixedwood and mixed conifer

Vegetation Type	Area, ac	Area, ha	Percent of Unit	NFFL Fuel Model	CFFDRS Fuel Type
Aspen-birch	66	27	25	8	M-2
Spruce-fir	124	50	47	9	C-2
Wetland grass	71	29	27	3	O-1b

General Descriptive Location: T 69N R 18W Sec. 32; along the south shore of the west end of Namakan Lake; boundaries are Namakan Lake to the north, Junction Bay to the east, and wetland areas to the south and west; elevation ranges from 1110 to 1230 ft (340 to 375 m); rolling topography averaging 7% slopes on southeast to northwest ridges with east and west aspects.

Purpose of the Burn: Hazard fuel reduction.

VegetationType	Acres	Hectares	
Spruce-Fir-Aspen Forest	92	37	
Quaking Aspen-Paper Birch Forest	73	30	
Black Spruce/Leatherleaf Semi-treed Bog	14	6	
White Pine-Red Pine-Quaking Aspen-Paper Birch Forest	12	5	
Wet Meadow/Fen Mosaic/Complex	12	5	
Pin Oak-Bur Oak Rocky Woodland (mixed pine-oak phase)	10	4	
Leatherleaf Bog	10	4	
Black Ash-Mixed Hardwood Swamp	8	3	
Trembling Aspen-Balsam Poplar Lowland Forest	6	3	
Boreal Pine Rocky Woodland (mixed pine phase)	5	2	
Speckled Alder Swamp	5	2	
Spruce-Fir/Mountain Maple Forest	5	2	
Northern Water Lily Aquatic Wetland	3	1	
Black Spruce/Labrador Tea Poor Swamp (evergreen phase)	3	1	
Boreal Hazelnut-Serviceberry Rocky Shrubland	2	1	
Black Spruce/Feathermoss Forest	1	0	
TOTAL	264	107	
Geology / Soils	Schist-rich migamatite - Dominantly biotite schist paleosome.		
Water Resources	None		
Flood Plain / Wetlands	43 acres (see above)		
Wildlife / Fisheries	None Known		
Threatened / Endangered / Sensitive Species	Animals	None Known	
	Plants	None Known	
Proposed Wilderness	Yes		
Park Facilities and Operations	None		

Name of the Unit: Spring Lake (Alternate)

Area: 836 ac (338 ha) – 635 ac (257 ha) VNP and 201 ac (81 ha) SUF

Type of Burn: Understory burn

Fuels: Timber – 60-70 yr old white pine mixed with aspen, birch, and red maple

Vegetation Type	Area, ac	Area, ha	Percent of Unit	NFFL Fuel Model	CFFDRS Fuel Type
Aspen-birch	25	10	3	8 / 9 *	M-2 / D-1 *
Mixedwood	259	105	31	8	M-1
Mixed pine	226	91	27	9	C-5
Jack pine	192	78	23	9	C-3
Black spruce	59	24	7	--	--
Wetland grass	75	30	9	3	O-1b

* 8 and M-2 for leaf on conditions; 9 and D-1 for leaf off conditions

General Descriptive Location: T 68N R 18W Sec. 10; in the southeastern portion of the Park along the southern boundary, approximately 10 mi (16 km) northwest of Crane Lake, 8 mi (13 km) east-southeast of the Ash River Community, and 4 mi (6 km) south of the Canadian border; includes 201 ac (81 ha) of Superior National Forest land; elevation ranges from 1,160 to 1,360 ft (354 to 415 m) with mostly 10% slopes and short ridges with southeast / northwest aspects.

Purpose of the Burn: Hazard fuel reduction, and ecosystem management – allowing fire to play its natural role as an ecosystem process.

Vegetation Type	Acres	Hectares	
Jack Pine-Aspen Forest Mosaic	218	88	
White Pine-Red Pine-Quaking Aspen-Paper Birch Forest	134	54	
Pin Oak-Bur Oak Rocky Woodland (mixed pine-oak phase)	99	40	
Quaking Aspen-Paper Birch Forest	83	33	
Boreal Pine Rocky Woodland (mixed pine phase)	78	31	
Black Spruce/Labrador Tea Poor Swamp (evergreen phase)	45	18	
Boreal Pine Rocky Woodland (jack pine phase)	25	10	
Wet Meadow/Fen Mosaic/Complex	24	10	
Mixed Aspen Rocky Woodland	23	9	
Jack Pine/Balsam Fir Forest	19	8	
Spruce-Fir/Mountain Maple Forest	14	6	
Speckled Alder Swamp	13	5	
Canada Bluejoint Eastern Meadow	11	4	
Spruce-Fir-Aspen Forest	10	4	
Black Ash-Mixed Hardwood Swamp	10	4	
Leatherleaf Bog	8	3	
Pin Oak-Bur Oak Rocky Woodland (deciduous phase)	5	2	
Midwest Pondweed Submerged Aquatic Wetland	4	2	
Deep Marsh Mosaic/Complex	3	1	
Beaver Basin Break-up Mosaic	2	1	
Black Spruce/Alder Rich Swamp	1	1	
Leatherleaf-Sweet Gale Shore Fen	1	1	
TOTAL	836	338	
Geology / Soils	Schist-rich migamatite and Lac La Croix Granite		
Water Resources	None		
Flood Plain / Wetlands	123 acres (see above)		
Wildlife / Fisheries	None Known		

Threatened / Endangered / Sensitive Species	Animals	None Known
	Plants	None Known
Proposed Wilderness	Yes	
Park Facilities and Operations	None	

Name of the Unit: Roothouse Pete (Alternate)

Area: 552 ac (224 ha)

Type of Burn: Understory burn

Fuels: Timber – red and white pine – NFFL Fuel Model 9, CFFDRS Fuel Type C-5.

General Descriptive Location: T 68N R 20W Sec. 4

Purpose of the Burn: Hazard fuel reduction.

Vegetation Type	Acres	Hectares	
Quaking Aspen-Paper Birch Forest	165	67	
Spruce-Fir-Aspen Forest	104	42	
Boreal Pine Rocky Woodland (jack pine phase)	62	25	
White Pine-Red Pine-Quaking Aspen-Paper Birch Forest	54	22	
Trembling Aspen-Balsam Poplar Lowland Forest	27	11	
White Cedar-Yellow Birch Forest	23	9	
Boreal Pine Rocky Woodland (mixed pine phase)	22	9	
White Cedar-Black Ash Swamp	19	8	
Speckled Alder Swamp	12	5	
Black Ash-Mixed Hardwood Swamp	11	4	
Jack Pine/Balsam Fir Forest	10	4	
Jack Pine/Lichen Rocky Barrens	8	3	
Spruce-Fir/Mountain Maple Forest	8	3	
Mixed Aspen Rocky Woodland	8	3	
White Cedar-Boreal Conifer Mesic Forest	7	3	
White Cedar-(Mixed Conifer)/Alder Swamp (rich soil phase)	6	2	
Jack Pine-Aspen Forest Mosaic	3	1	
Boreal Hazelnut-Serviceberry Rocky Shrubland	2	1	
Black Spruce/Labrador Tea Poor Swamp (evergreen phase)	1	0	
TOTAL	552	224	
Geology / Soils Lac La Croix granite - biotite granite.			
Water Resources 0.56 km of streams			
Flood Plain / Wetlands 72 acres (see above)			
Wildlife / Fisheries None Known			
Threatened / Endangered / Sensitive Species		Animals	None Known
		Plants	None Known
Proposed Wilderness Yes			
Park Facilities and Operations None			

Name of the Unit: Marion Bay / Finlander Bay (Alternate)

Area: 2,444 ac (989 ha)

Type of Burn: Understory burn

Fuels: Timber – red and white pine and mixedwood – NFFL Fuel Models 9 and 8, CFFDRS Fuel Types C-5 and M-1.

General Descriptive Location: T 70N R 20W Sec. 8

Purpose of the Burn: Hazard fuel reduction.

Vegetation Type	Acres	Hectares	
Spruce-Fir-Aspen Forest	507	205	
Quaking Aspen-Paper Birch Forest	423	171	
White Pine-Red Pine-Quaking Aspen-Paper Birch Forest	230	93	
Jack Pine-Aspen Forest Mosaic	209	84	
Spruce-Fir/Mountain Maple Forest	161	65	
Jack Pine/Balsam Fir Forest	159	64	
Pin Oak-Bur Oak Rocky Woodland (mixed pine-oak phase)	124	50	
Wet Meadow/Fen Mosaic/Complex	89	36	
Boreal Pine Rocky Woodland (mixed pine phase)	83	33	
White Pine/Mountain Maple Mesic Forest	82	33	
Black Spruce/Feathermoss Forest	56	23	
Deep Marsh Mosaic/Complex	48	19	
Pin Oak-Bur Oak Rocky Woodland (jack pine-oak phase)	41	17	
Black Spruce/Labrador Tea Poor Swamp (evergreen phase)	35	14	
Canada Bluejoint Eastern Meadow	33	13	
Speckled Alder Swamp	25	10	
Black Spruce/Alder Rich Swamp	24	10	
Midwest Pondweed Submerged Aquatic Wetland	24	10	
Black Ash-Mixed Hardwood Swamp	15	6	
Beaver Basin Break-up Mosaic	13	5	
Boreal Pine Rocky Woodland (jack pine phase)	13	5	
Northern Tamarack Rich Swamp	11	4	
Pin Oak-Bur Oak Rocky Woodland (deciduous phase)	11	4	
Leatherleaf Bog	10	4	
Trembling Aspen-Balsam Poplar Lowland Forest	2	1	
Water-Beaver Pond	2	1	
Boreal Hazelnut-Serviceberry Rocky Shrubland	2	1	
Mixed Aspen Rocky Woodland	2	1	
TOTAL	2444	989	
Geology / Soils Metasedimentary rocks, undivided - biotite-quartz-plagioclase schist and metagraywacke.			
Water Resources 2 acre beaver pond, 5.99 km of streams			
Flood Plain / Wetlands 385 acres (see above)			
Wildlife / Fisheries None Known			
Threatened / Endangered / Sensitive Species	Animals	1 Osprey nest	
	Plants	None Known	
Proposed Wilderness Yes			
Park Facilities and Operations 2 campsites			

Name of the Unit: Wiyapka Lake East (Alternate)

Area: 343 ac (139 ha)

Type of Burn: Understory burn

Fuels: Timber.

General Descriptive Location: T 69N R 18W Sec. 5; near Wiyapka Lake.

Purpose of the Burn: Hazard fuel reduction.

Vegetation Type	Acres	Hectares	
White Pine-Red Pine-Quaking Aspen-Paper Birch Forest	108	44	
Quaking Aspen-Paper Birch Forest	58	24	
Spruce-Fir-Aspen Forest	40	16	
Mixed Aspen Rocky Woodland	27	11	
Pin Oak-Bur Oak Rocky Woodland (mixed pine-oak phase)	21	9	
Wet Meadow/Fen Mosaic/Complex	17	7	
Boreal Pine Rocky Woodland (mixed pine phase)	15	6	
Northern Tamarack Rich Swamp	13	5	
Black Spruce/Labrador Tea Poor Swamp (evergreen phase)	10	4	
Spruce-Fir/Mountain Maple Forest	9	4	
Deep Marsh Mosaic/Complex	6	2	
Boreal Pine Rocky Woodland (jack pine phase)	6	2	
Speckled Alder Swamp	3	1	
Jack Pine-Aspen Forest Mosaic	3	1	
Pin Oak-Bur Oak Rocky Woodland (deciduous phase)	3	1	
Canada Bluejoint Eastern Meadow	2	1	
Black Spruce/Feathermoss Forest	2	1	
TOTAL	343	139	
Geology / Soils	Granite-rich migmatite		
Water Resources	2 acre pond		
Flood Plain / Wetlands	52 acres (see above)		
Wildlife / Fisheries	None Known		
Threatened / Endangered / Sensitive Species	Animals	None Known	
	Plants	None Known	
Proposed Wilderness	Yes		
Park Facilities and Operations	None		

I. Fire Prevention Plan

Fire prevention emphasis for Voyageurs National Park is based on an analysis of fire risk, fire hazard and values at risk in the Park. Fire risk is based on occurrence of 178 wildland fires from 1974 to 2001 (Table I-1).

Table I-1

VOYAGEURS NATIONAL PARK WILDLAND FIRES

1974 - 2001

Numbers / Causes / Area Burned

NUMBER OF FIRES					AREA BURNED, acres				
YEAR	HUMAN	LIGHTNING	PRESCRIB'D	TOTAL	HUMAN	LIGHTNING	PNF	MIPF	TOTAL
1974	4	1	---	5	5.0	3.0	---	---	8.0
1975	6	1	---	7	7.0	0.1	---	---	7.1
1976	6	5	---	11	5.1	8.1	---	---	13.2
1977	3	2	---	5	3.0	1.1	---	---	4.1
1978	1	1	---	2	1.0	1.0	---	---	2.0
1979	4	5	---	9	4.1	6.0	---	---	10.1
1980	14	7	---	21	14.7	334.3	---	---	349.0
1981	6	0	---	6	5.1	0.0	---	---	5.1
1982	1	1	---	2	1.0	0.1	---	---	1.1
1983	3	0	---	3	3.0	0.0	---	---	3.0
1984	4	1	---	5	1.3	2.0	---	---	3.3
1985	0	1	---	1	0.0	0.1	---	---	0.1
1986	3	0	---	3	0.1	0.1	---	---	0.2
1987	0	2	---	2	0.0	0.6	---	---	0.6
1988	1	2	---	3	0.1	0.0	35	---	35.1
1989	4	2	2	8	0.9	1.0	0.0	175.7	177.6
1990	7	1	2	10	0.7	0.0	42.0	200.0	242.7
1991	8	11	1	20	9.4	846.8	0.0	295.0	1151.2
1992	7	2	1	10	2.4	0.2	0.0	325.0	327.6
1993	2	0	1	3	0.2	0.0	0.0	288.0	288.2
1994	4	0	2	6	0.4	0.0	0.0	72.0	72.4
1995	7	4	2	13	3.5	6.2	0.0	247.0	256.7
1996	2	1	2	5	0.8	0.1	0.0	43.0	43.9
1997	10	2	3	15	41.9	2.5	0.0	207.0	251.4
1998	9	5	3	17	4.4	0.7	0.0	155.0	160.1
1999	4	0	4	8	1.1	0.0	0.0	671.0	672.1
2000	0	1	5	6	0.0	0.5	0.0	383.5	384.0
2001	5	0	0	5	3.3	0	0	383.5	386.8
TOTALS	125	58	28	211	119.5	1214.5	77	3445.7	4856.7
Percent	61%	28%	14%	102%	3%	27%	2%	78%	110%

1. Fire Risk Analysis

Risk is defined as any heat source or human ignition which can start a wildland fire.

An analysis of the fire occurrence history in Voyageurs National Park from 1974 – 2001 reveals that human caused fires made up 67% of the wildland fires and lightning caused fires made up 33%. The human caused fires are primarily limited to lakeshores and islands while 2/3 of lightning fires occur in the interior with the remaining 1/3 occurring close to lakeshores.

Fire occurrence maps (Figure I-1) for VOYAGEURS NATIONAL PARK indicate that all over 99% of human caused fires occurred on the large accessible lakes on the main travel routes in the Park with only 3 fires occurring on more remote, interior lakes. These fires are almost entirely the result of escaped campfires, either from designated camping sites or from undesignated “shore lunch” spots where cooking fires were built after fishing.

INSERT FIGURE I-1 (FIRE OCCURRENCE MAP) HERE

2. Fire Hazard Analysis

Hazard is defined as the fuels and topography on which a fire will spread.

While the human caused ignitions make up the majority of fire starts in the Park, the lightning caused fires (including WFU fires) have burned 88% of the total acreage burned by wildland fires. This is due to several factors, primarily quick access by suppression forces. In addition, fire acreage was certainly limited when prevailing winds pushed the fire away from the interior and towards the water. Fires starting in the interior on the other hand, are more difficult to attack and fuel availability is normally greater.

Problem fuel areas are those with advanced balsam fir in the understory of mature red, white and jack pine stands, areas of bug killed balsam fir and spruce, pockets of blowdown, and areas of continuous jack pine. Fuel type maps for the park are found in Figures I-2 and I-3.

INSERT FIGURE I-2 (CANADIAN FUEL MODEL MAP) HERE

INSERT FIGURE I-3 (US FUEL MODEL MAP) HERE

3. Values Analysis

Values are defined as areas where the losses from wildland fire would be unacceptable.

As stated in Section XI, primary values areas of concern are the developments, infrastructure, inholdings and archeological, cultural and historic resources in the Park. These areas are predominantly found within the area of increased human fire occurrence along water travel routes.

4. Planned Fire Prevention Activities:

Strategies for fire prevention at Voyageurs will be a mix of engineering, education, and enforcement.

- a. Engineering is the process of reducing risks and hazards by shielding or removing heat sources or by removing fuels.

Hazard fuel reduction through prescribed burning and mechanical treatments are the primary means of using engineering in fire prevention at Voyageurs National Park. As stated in Section V, prescribed fire will be used primarily in treating pine stands with moderate to high hazard fuels in low to moderate value areas; while mechanical treatments are the primary means to treat moderate to high hazard fuels in moderate to high value areas.

- b. Education emphasizes the need to inform the public of the importance of wildland fire prevention. Activities will include:
 - Pertinent signs, posters, and notices will be posted on park bulletin boards, and at visitor centers, developed campsites and day use sites, and neighboring resorts.
 - Pertinent messages will be included in park publications, such as the park folder and newspaper, camping and hiking brochures, nature trail guides, on the park website, and a site bulletin describing Voyageurs' wildland fire management program, and news releases to local and regional media.
 - Pertinent messages will be included in visitor center exhibits, lightning caused wildland fires (not including those managed for resource benefit) interpretative talks, and NPS and concession orientations for new and returning employees.
 - A slide/tape or video tape program will be developed that describes Voyageurs' wildland fire management program for use in visitor centers or for loan to educational or nonprofit groups.
 - Pertinent messages will be included in informal contacts between uniformed NPS employees and park visitors and neighbors.

- Pertinent messages will be included in informal contacts between concession/commercial use license employees and park visitors and neighbors.
 - Programs at local schools will emphasize fire's natural role in the park ecosystem and the prevention of human-caused wildland fires.
- c. Enforcement of rules and regulations pertaining to fire will be aggressive as fire danger increases. Burning restrictions are coordinated with the other MNICS agencies through the use standardized regulations found in Section 41 of the MNICS Mobilization Guide. Other enforcement activities include:
- Wood fires will be restricted to metal fire grills at developed campsites and day use sites.
 - Prior to the opening of fishing season in mid-May, Maintenance personnel will clear the area around each fire grill of encroaching vegetation, and branches overhanging fire grills will be limbed.
 - Patrols by park rangers, particularly during the evening, will enforce compliance with the policy of restricting wood fires to developed sites and with any open burning restrictions that may be in effect due to high fire danger.
 - Open burning at retained use and occupancy cabin sites, and on private lands within the park will require the permission of the appropriate District Ranger or the Chief Park Ranger.
 - Local power companies will check power lines for tree clearance and will correct deficiencies.
 - Any restrictions deemed necessary during periods of extreme fire danger will be publicized on radio and television, and in local newspapers.
 - Formal annual fire/safety building inspections will be conducted by the park's Safety Officer. The Chief Park Ranger and the Facility Manager will clear up any hazards identified during such inspections as soon as possible.

FY 2002

Name of the Unit: Bullwinkle, 2002

Area: 355 ac (144 ha)

Type of Burn: Marsh grass

Fuels: Grass, brush.

General Descriptive Location: T 70N R 20W Sec. 21; drainages north of Shoepack Lake.

Purpose of the Burn: To rejuvenate decadent willow and stimulate sprouting of willow species, to reduce annuals and dead herbaceous cover, to prevent build-up of debris on the marsh floor, to reduce the invasion of woody vegetation into this marsh ecosystem (may require multiple burns), and to foster a change in albedo that permits earlier spring growth.

Vegetation Type	Acres	Hectares	
Wet Meadow/Fen Mosaic/Complex	115	47	
Speckled Alder Swamp	39	16	
Deep Marsh Mosaic/Complex	36	15	
Leatherleaf-Sweet Gale Shore Fen	34	14	
Black Spruce/Leatherleaf Semi-treed Bog	26	11	
Northern Water Lily Aquatic Wetland	21	8	
Canada Bluejoint Eastern Meadow	11	4	
Leatherleaf Bog	11	4	
Spruce-Fir-Aspen Forest	11	4	
Quaking Aspen-Paper Birch Forest	8	3	
Midwest Pondweed Submerged Aquatic Wetland	8	3	
Jack Pine-Aspen Forest Mosaic	7	3	
Boreal Pine Rocky Woodland (mixed pine phase)	5	2	
Jack Pine/Balsam Fir Forest	2	1	
Small Island with Trees	2	1	
Northern Tamarack Rich Swamp	2	1	
Spruce-Fir/Mountain Maple Forest	2	1	
Black Ash-Mixed Hardwood Swamp	2	1	
Black Spruce/Labrador Tea Poor Swamp (evergreen phase)	1	0	
Boreal Pine Rocky Woodland (jack pine phase)	1	0	
TOTAL	355	144	
Geology / Soils Metasedimentary rocks, undivided - biotite-quartz-plagioclase schist and metagraywacke.			
Water Resources 6.66 km of streams			
Flood Plain / Wetlands 307 acres (see above)			
Wildlife / Fisheries None Known			
Threatened / Endangered / Sensitive Species		Animals	None Known
		Plants	None Known
Proposed Wilderness Yes			
Park Facilities and Operations None			

Name of the Unit: Whispering Pines I, 2002

Area: 22 ac (9 ha)

Type of Burn: Understory burn

Fuels: Timber – red and white pine – NFFL Fuel Model 9, CFFDRS Fuel Type C-5.

General Descriptive Location: T 69N R 20W Sec. 25; just south and southwest of Ash River Visitor center upper parking lot, bounded by the Meadwood Road and the road to Building 94; elevation between 1150 and 1265 ft (350 and 385 m); slopes generally 2-3% on short ridges with northeast and southwest aspects.

Purpose of the Burn: Hazard fuels reduction, and ecosystem management – allowing fire to play its natural role as an ecosystem process.

Vegetation Type	Acres	Hectares	
White Pine-Red Pine-Quaking Aspen-Paper Birch Forest	12	5	
White Pine/Mountain Maple Mesic Forest	7	3	
TOTAL	22	9	
Geology / Soils	Granite-rich migmatite and Schist-rich migamatite		
Water Resources	None		
Flood Plain / Wetlands	None		
Wildlife / Fisheries	None Known		
Threatened / Endangered / Sensitive Species	Animals	None Known	
	Plants	None Known	
Proposed Wilderness	No		
Park Facilities and Operations	Seasonal Housing - 1 unit		

Name of the Unit: Tar Point, 2002

Area: 16 ac (6 ha)

Type of Burn: Understory burn

Fuels: Timber – red and white pine – NFFL Fuel Model 9, CFFDRS Fuel Type C-5.

General Descriptive Location: T 69N R 20W Sec. 21; Tar Point.

Purpose of the Burn: Ecosystem management – allowing fire to play its natural role as an ecosystem process; reduce undergrowth, open the canopy, decrease litter and duff on the fuel bed, and encourage pine regeneration.

Vegetation Type	Acres	Hectares	
White Pine-Red Pine-Quaking Aspen-Paper Birch Forest	16	6	
TOTAL	16	6	
Geology / Soils	Schist-rich migamatite - Dominantly biotite schist paleosome.		
Water Resources	None		
Flood Plain / Wetlands	None		
Wildlife / Fisheries	None Known		
Threatened / Endangered / Sensitive Species	Animals	None Known	
	Plants	None Known	
Proposed Wilderness	Yes		
Park Facilities and Operations	None		

Name of the Unit: Ryan Lake Southeast, 2002

Area: 125 ac (51 ha)

Type of Burn: Understory burn

Fuels: Timber – 120-year old white and red pine, and mixedwood

Vegetation Type	Area, ac	Area, ha	Percent of Unit	NFFL Fuel Model	CFFDRS Fuel Type
White / red pine	78	32	62	9	C-5
Mixedwood	48	19	38	8	M-2 *

* 80% hardwood, 20% conifer

General Descriptive Location: T 70N R 18W Sec. 30; approximately 0.3 mi (0.5 km) north of Mica Bay on Namakan Lake, 0.25 mi (0.4 km) southeast of Ryan Lake, and 1.0 mi (1.6 km) south of Rainy Lake; bordered by wetland swamps on the east and south, a moist forested drainage on the west, and an old logging road connecting black spruce bogs on the north; elevation ranges from 1161 to 1240 ft (354 to 378 m) with an average 10% slope on south and east aspects and 28% slope on west aspects.

Purpose of the Burn: Hazard fuel reduction, and ecosystem management – replicating natural, low-intensity fire in a fire-adapted ecosystem.

Vegetation Type	Acres	Hectares	
White Pine-Red Pine-Quaking Aspen-Paper Birch Forest	80	32	
Quaking Aspen-Paper Birch Forest	22	9	
White Pine/Mountain Maple Mesic Forest	10	4	
Black Spruce/Alder Rich Swamp	5	2	
Spruce-Fir-Aspen Forest	4	2	
Beaver Basin Break-up Mosaic	2	1	
Trembling Aspen-Balsam Poplar Lowland Forest	1	0	
Wet Meadow/Fen Mosaic/Complex	1	0	
TOTAL	125	51	
Geology / Soils	Metasedimentary rocks, undivided - biotite-quartz-plagioclase schist and metagraywacke.		
Water Resources	None		
Flood Plain / Wetlands	8 acres (see above)		
Wildlife / Fisheries	None Known		
Threatened / Endangered / Sensitive Species	Animals	None Known	
	Plants	None Known	
Proposed Wilderness	Yes		
Park Facilities and Operations	None		

FY 2003

Name of the Unit: Cranberry, 2003

Area: 587 ac (238 ha)

Type of Burn: Marsh Grass

Fuels: Grass, brush.

General Descriptive Location: T 71N R21W Sec. 32; Cranberry Bay, east and west sides of Cranberry Creek, and adjoining drainages; elevation 1,120 ft (341 m).

Purpose of the Burn: To rejuvenate decadent willow and stimulate sprouting of willow species, to reduce annuals and dead herbaceous cover, to prevent build-up of debris on the marsh floor, to reduce the invasion of woody vegetation into this marsh ecosystem (may require several burns), and to foster a change in albedo that permits earlier spring growth.

Vegetation Type	Acres	Hectares	
Wet Meadow/Fen Mosaic/Complex	288	117	
Leatherleaf-Sweet Gale Shore Fen	64	26	
Canada Bluejoint Eastern Meadow	50	20	
Deep Marsh Mosaic/Complex	43	18	
Midwest Cattail Deep Marsh	25	10	
Jack Pine-Aspen Forest Mosaic	19	8	
Northern Water Lily Aquatic Wetland	13	5	
Dogwood-Pussy Willow Swamp	12	5	
Spruce-Fir-Aspen Forest	12	5	
Spruce-Fir/Mountain Maple Forest	10	4	
Quaking Aspen-Paper Birch Forest	9	3	
Speckled Alder Swamp	8	3	
Leatherleaf Bog	6	3	
Jack Pine/Balsam Fir Forest	5	2	
Bog Birch-Willow Shore Fen	4	2	
Boreal Pine Rocky Woodland (jack pine phase)	4	2	
Small Island with Trees	3	1	
Trembling Aspen-Balsam Poplar Lowland Forest	3	1	
Small Island with Shrubs	2	1	
Pin Oak-Bur Oak Rocky Woodland (jack pine-oak phase)	2	1	
Black Ash-Mixed Hardwood Swamp	2	1	
Wild Rice Marsh	2	1	
Pin Oak-Bur Oak Rocky Woodland (mixed pine-oak phase)	1	0	
TOTAL	587	238	
Geology / Soils Metasedimentary rocks, undivided - biotite-quartz-plagioclase schist and metagraywacke.			
Water Resources None			
Flood Plain / Wetlands 522 acres (see above)			
Wildlife / Fisheries None Known			
Threatened / Endangered / Sensitive Species	Animals	1 Osprey nest	
	Plants	None Known	
Proposed Wilderness Yes			
Park Facilities and Operations None			

Name of the Unit: Net Lake East, 2003

Area: 257 ac (104 ha)

Type of Burn: Understory burn

Fuels: Timber – 130-year old white and red pine, and aspen/birch mixedwood

Vegetation Type	Area, ac	Area, ha	Percent of Unit	NFFL Fuel Model	CFFDRS Fuel Type
White / red pine	98	40	38	9	C-5
Mixedwood	139	56	54	8	M-1
Balsam fir	10	4	4	10	M-3
Wetland Marsh	10	4	4	3	O-1b

General Descriptive Location: T 68N R 18W Sec. 3; southeast side of Net Lake and southwest side of Tooth Lake, 0.3 mi (0.5 km) north of the Park boundary; bordered by lakes to the west and northeast, by wetland swamps on the south, and by wet drainage to the west; elevation ranges from 1150 to 1320 ft (350 to 400 m) with an average 44% slope on southeast / northwest aspects.

Purpose of the Burn: Hazard fuel reduction; also, ecosystem management – replicate a natural, low-intensity fire in this fire-adapted ecosystem.

Vegetation Type	Acres	Hectares	
White Pine-Red Pine-Quaking Aspen-Paper Birch Forest	77	31	
Quaking Aspen-Paper Birch Forest	58	23	
Leatherleaf-Sweet Gale Shore Fen	21	8	
Speckled Alder Swamp	20	8	
Leatherleaf Bog	16	7	
Wet Meadow/Fen Mosaic/Complex	15	6	
Spruce-Fir-Aspen Forest	10	4	
Boreal Pine Rocky Woodland (mixed pine phase)	8	3	
Black Ash-Mixed Hardwood Swamp	6	2	
Canada Bluejoint Eastern Meadow	6	2	
Pin Oak-Bur Oak Rocky Woodland (mixed pine-oak phase)	5	2	
Mixed Aspen Rocky Woodland	5	2	
Boreal Hazelnut-Serviceberry Rocky Shrubland	3	1	
Black Spruce/Leatherleaf Semi-treed Bog	3	1	
Trembling Aspen-Balsam Poplar Lowland Forest	2	1	
TOTAL	257	104	
Geology / Soils	Granite-rich migmatite and Schist-rich migmatite.		
Water Resources	1.13 km of streams		
Flood Plain / Wetlands	82 acres (see above)		
Wildlife / Fisheries	None Known		
Threatened / Endangered / Sensitive Species	Animals	None Known	
	Plants	None Known	
Proposed Wilderness	Yes		
Park Facilities and Operations	None		

Name of the Unit: Meander Corner, 2003

Area: 52 ac (21 ha)

Type of Burn: Understory burn

Fuels: Timber – 120-year old white and red pine, and mixedwood – NFFL Fuel Models 9 and 8, CFFDRS Fuel Types C-5 and M-1.

General Descriptive Location: T 70N R 18W Sec. 31; north side of Mica Bay and Squirrel Narrows on Namakan Lake, directly north-northwest of Mica Island; boundaries are Namakan Lake to the south, a wet drainage to the east, and an old logging road along the northern perimeter.

Purpose of the Burn: Hazard fuel reduction to prevent a stand-replacement fire; also ecosystem management – replicate a natural, low-intensity fire that will kill hardwoods and brush competition and stimulate natural reproduction of white pine.

Vegetation Type	Acres	Hectares	
White Pine/Mountain Maple Mesic Forest	27	11	
White Pine-Red Pine-Quaking Aspen-Paper Birch Forest	7	3	
Boreal Pine Rocky Woodland (jack pine phase)	5	2	
Quaking Aspen-Paper Birch Forest	4	2	
Spruce-Fir-Aspen Forest	4	1	
Pin Oak-Bur Oak Rocky Woodland (mixed pine-oak phase)	2	1	
Trembling Aspen-Balsam Poplar Lowland Forest	2	1	
TOTAL	52	21	
Geology / Soils	Metasedimentary rocks, undivided - biotite-quartz-plagioclase schist and metagraywacke.		
Water Resources	None		
Flood Plain / Wetlands	None		
Wildlife / Fisheries	None Known		
Threatened / Endangered / Sensitive Species	Animals	None Known	
	Plants	None Known	
Proposed Wilderness	Yes		
Park Facilities and Operations	None		

Name of the Unit: Whispering Pines II, 2003

Area: 63 ac (25 ha)

Type of Burn: Understory burn

Fuels: Timber – red and white pine – NFFL Fuel Model 9, CFFDRS Fuel Type C-5.

General Descriptive Location: T 69N R 20W Sec. 25; just East of the Meadwood Road and south of the road to Whispering Pines housing area; elevation between 1150 and 1265 ft (350 and 385 m); slopes generally 2-3% on short ridges with northeast and southwest aspects.

Purpose of the Burn: Hazard fuels reduction, and ecosystem management – allowing fire to play its natural role as an ecosystem process.

Vegetation Type	Acres	Hectares	
White Pine-Red Pine-Quaking Aspen-Paper Birch Forest	30	12	
Quaking Aspen-Paper Birch Forest	11	4	
Red Pine/Blueberry Dry Forest	11	4	
White Pine/Mountain Maple Mesic Forest	9	4	
TOTAL	63	25	
Geology / Soils	Granite-rich migmatite and Schist-rich migamatite		
Water Resources	None		
Flood Plain / Wetlands	None		
Wildlife / Fisheries	None Known		
Threatened / Endangered / Sensitive Species	Animals	None Known	
	Plants	None Known	
Proposed Wilderness	No		
Park Facilities and Operations	None		

FY 2004

Name of the Unit: Rocky, 2004

Area: 628 ac (254 ha)

Type of Burn: Marsh Grass

Fuels: Grass, brush

General Descriptive Location: T 69N R 18W Sec. 34; north and east of Tooth Lake.

Purpose of the Burn: To rejuvenate and stimulate sprouting of decadent willow, to reduce herbaceous cover, to prevent build-up of debris, to reduce the invasion of woody vegetation (may require several burns), and to foster a change in albedo that permits earlier spring growth.

Vegetation Type	Acres	Hectares	
Wet Meadow/Fen Mosaic/Complex	140	57	
Leatherleaf Bog	78	31	
Northern Water Lily Aquatic Wetland	59	24	
Black Spruce/Leatherleaf Semi-treed Bog	47	19	
Speckled Alder Swamp	45	18	
Pin Oak-Bur Oak Rocky Woodland (mixed pine-oak phase)	33	13	
Canada Bluejoint Eastern Meadow	30	12	
Deep Marsh Mosaic/Complex	27	11	
Black Spruce/Labrador Tea Poor Swamp (evergreen phase)	25	10	
Boreal Pine Rocky Woodland (mixed pine phase)	25	10	
White Pine-Red Pine-Quaking Aspen-Paper Birch Forest	17	7	
Jack Pine-Aspen Forest Mosaic	16	6	
Beaver Basin Break-up Mosaic	13	5	
Quaking Aspen-Paper Birch Forest	12	5	
Jack Pine/Balsam Fir Forest	9	4	
Mixed Aspen Rocky Woodland	8	3	
Leatherleaf-Sweet Gale Shore Fen	7	3	
Boreal Pine Rocky Woodland (jack pine phase)	6	3	
Midwest Pondweed Submerged Aquatic Wetland	5	2	
Spruce-Fir/Mountain Maple Forest	4	2	
Spruce-Fir-Aspen Forest	4	2	
Northern Tamarack Rich Swamp	4	2	
Black Spruce/Alder Rich Swamp	2	1	
Boreal Hazelnut-Serviceberry Rocky Shrubland	2	1	
Water-Beaver Pond	2	1	
Black Ash-Mixed Hardwood Swamp	2	1	
TOTAL	628	254	
Geology / Soils	Lac La Croix Granite, Granite-rich migmatite, Schist-rich migamatite, Grasnitic leucogneiss		
Water Resources	2 acre beaver pond, 6.68 km of streams		
Flood Plain / Wetlands	434 acres (see above)		
Wildlife / Fisheries	None Known		
Threatened / Endangered / Sensitive Species	Animals	None Known	
	Plants	None Known	
Proposed Wilderness	Yes		
Park Facilities and Operations	None		

Name of the Unit: Daley Bay, 2004

Area: 173 ac (70 ha)

Type of Burn: Understory burn / stand replacement

Fuels: Timber – 60-70 year old jack pine / mixed conifers

Vegetation Type	Area, ac	Area, ha	Percent of Unit	NFFL Fuel Model	CFFDRS Fuel Type
Aspen-mixed conifer	29	12	17	2 / 8 *	D-1 / M-2 *
Jack pine	116	47	67	9	C-3
Red pine	3	1	2	9	C-5
Wetland marsh	24	10	14	3	O-1b

* 2 and D-1 for leaves absent condition; 8 and M-2 for leaves present condition

General Descriptive Location: T 69N R 29W Sec. 32; south-central portion of the Park, at the southeast end of Kabetogoma Lake near Daley Bay, east of Daley Brook, approximately 1.0 mi (1.6 km) northwest of the Park boundary; boundaries are wetlands on the north, west, and south sides and an old winter road on the east side; elevation ranges from 1120 to 1260 ft (340 to 415 m) with mostly 10% slopes on a dominant east-west ridge.

Purpose of the Burn: Hazard fuel reduction; also, ecosystem management – replicate a natural, low-intensity fire in this fire-adapted ecosystem.

Vegetation Type	Acres	Hectares	
Quaking Aspen-Paper Birch Forest	88	31	
Boreal Pine Rocky Woodland (jack pine phase)	28	11	
Mixed Aspen Rocky Woodland	13	5	
Speckled Alder Swamp	9	4	
Trembling Aspen-Balsam Poplar Lowland Forest	9	4	
Boreal Pine Rocky Woodland (mixed pine phase)	8	3	
Dogwood-Pussy Willow Swamp	7	3	
Jack Pine/Lichen Rocky Barrens	6	3	
Pin Oak-Bur Oak Rocky Woodland (mixed pine-oak phase)	6	2	
Spruce-Fir-Aspen Forest	4	2	
White Cedar-Black Ash Swamp	3	1	
Black Ash-Mixed Hardwood Swamp	3	1	
White Cedar-Yellow Birch Forest	1	0	
TOTAL	173	70	
Geology / Soils	Lac La Croix granite - biotite granite.		
Water Resources	None		
Flood Plain / Wetlands	31 acres (see above)		
Wildlife / Fisheries	None Known		
Threatened / Endangered / Sensitive Species	Animals	None Known	
	Plants	None Known	
Proposed Wilderness	Yes		
Park Facilities and Operations	None		

Name of the Unit: Ryan Lake North, 2004

Area: 571 ac (231 ha)

Type of Burn: Understory burn

Fuels: Timber – 120-year old white and red pine, and mixedwood – NFFL Fuel Models 9 and 8, CFFDRS Fuel Types C-5 and M-1.

General Descriptive Location: T 70N R19W Sec. 25; north side of Mica Bay and Squirrel Narrows on Namakan Lake, directly north-northwest of Mica Island; boundaries are drainages to the east and northeast, wet cedar stands on the south and west sides, and a brushed line to connect Ryan Lake with wetlands to the east on the northern perimeter.

Purpose of the Burn: Hazard fuel reduction to prevent a stand-replacement fire; also ecosystem management – replicate a natural, low-intensity fire that will kill hardwoods and brush competition and stimulate natural reproduction of white pine.

Vegetation Type	Acres	Hectares	
White Pine-Red Pine-Quaking Aspen-Paper Birch Forest	171	69	
Quaking Aspen-Paper Birch Forest	129	52	
Spruce-Fir-Aspen Forest	63	26	
White Pine/Mountain Maple Mesic Forest	53	21	
Jack Pine/Balsam Fir Forest	27	11	
Wet Meadow/Fen Mosaic/Complex	23	9	
Deep Marsh Mosaic/Complex	23	9	
Red Pine/Blueberry Dry Forest	17	7	
Black Spruce/Alder Rich Swamp	10	4	
Northern Water Lily Aquatic Wetland	8	3	
Spruce-Fir/Mountain Maple Forest	7	3	
Boreal Pine Rocky Woodland (jack pine phase)	6	2	
Black Spruce/Labrador Tea Poor Swamp (evergreen phase)	6	2	
Speckled Alder Swamp	5	2	
Boreal Pine Rocky Woodland (mixed pine phase)	5	2	
Trembling Aspen-Balsam Poplar Lowland Forest	3	1	
Jack Pine-Aspen Forest Mosaic	3	1	
Pin Oak-Bur Oak Rocky Woodland (mixed pine-oak phase)	3	1	
Leatherleaf Bog	2	1	
Black Ash-Mixed Hardwood Swamp	1	1	
TOTAL	571	231	
Geology / Soils	Metasedimentary rocks, undivided - biotite-quartz-plagioclase schist and metagraywacke.		
Water Resources	1 acre pond, 0.73 km of streams		
Flood Plain / Wetlands	82 acres (see above)		
Wildlife / Fisheries	None Known		
Threatened / Endangered / Sensitive Species	Animals	None Known	
	Plants	lichen	
Proposed Wilderness	Yes		
Park Facilities and Operations	None		

Name of the Unit: North Rottenwood, 2004

Area: 230 ac (93 ha)

Type of Burn: Understory burn

Fuels: Timber.

General Descriptive Location: T 70N R 21W Sec. 19

Purpose of the Burn: Hazard fuel reduction.

Vegetation Type	Acres	Hectares	
Spruce-Fir-Aspen Forest	71	29	
Quaking Aspen-Paper Birch Forest	58	23	
White Pine-Red Pine-Quaking Aspen-Paper Birch Forest	54	22	
White Pine/Mountain Maple Mesic Forest	17	7	
Black Ash-Mixed Hardwood Swamp	9	3	
Northern Bur Oak Mesic Forest	6	3	
Spruce-Fir/Mountain Maple Forest	5	2	
Wet Meadow/Fen Mosaic/Complex	4	2	
Trembling Aspen-Balsam Poplar Lowland Forest	3	1	
Northern Tamarack Rich Swamp	2	1	
Boreal Pine Rocky Woodland (mixed pine phase)	1	0	
TOTAL	230	93	
Geology / Soils	Metasedimentary rocks, undivided - biotite-quartz-plagioclase schist and metagraywacke.		
Water Resources	None		
Flood Plain / Wetlands	14 acres (see above)		
Wildlife / Fisheries	None Known		
Threatened / Endangered / Sensitive Species	Animals	Eagle nest	
	Plants	None Known	
Proposed Wilderness	Yes		
Park Facilities and Operations	2 campsites		

Name of the Unit: Whispering Pines III, 2004

Area: 43 ac (17 ha)

Type of Burn: Understory burn

Fuels: Timber – red and white pine – NFFL Fuel Model 9, CFFDRS Fuel Type C-5.

General Descriptive Location: T 69N R 20W Sec. 25; just south of Whispering Pines II, south of the road to the Whispering Pines housing area, and east of Meadwood Road; elevation between 1150 and 1265 ft (350 and 385 m); slopes generally 2-3% on short ridges with northeast and southwest aspects.

Purpose of the Burn: Hazard fuels reduction, and ecosystem management – allowing fire to play its natural role as an ecosystem process.

Vegetation Type	Acres	Hectares	
White Pine/Mountain Maple Mesic Forest	21	9	
White Pine-Red Pine-Quaking Aspen-Paper Birch Forest	8	3	
Red Pine/Blueberry Dry Forest	8	3	
Boreal Hazelnut-Serviceberry Rocky Shrubland	3	1	
Trembling Aspen-Balsam Poplar Lowland Forest	2	1	
TOTAL	43	17	
Geology / Soils	Granite-rich migmatite		
Water Resources	None		
Flood Plain / Wetlands	None		
Wildlife / Fisheries	None Known		
Threatened / Endangered / Sensitive Species	Animals	None Known	
	Plants	None Known	
Proposed Wilderness	No		
Park Facilities and Operations	None		

FY 2005

Name of the Unit: Frostbite, 2005

Area: 470 ac (190 ha)

Type of Burn: Marsh Grass

Fuels: Grass, brush.

General Descriptive Location: T 70N R 22W Sec. 25, 30, 36 and T69N R 22W Sec. 1,2,11; Tom Cod Bay; elevation 1,125 ft (343 m).

Purpose of the Burn: To rejuvenate decadent willow and stimulate sprouting of willow species, to reduce annuals and dead herbaceous cover, to prevent build-up of debris on the marsh floor, to reduce the invasion of woody vegetation into this marsh ecosystem (may require several burns), and to foster a change in albedo that permits earlier spring growth.

Vegetation Type	Acres	Hectares	
Black Spruce/Leatherleaf Semi-treed Bog	150	60	
Wet Meadow/Fen Mosaic/Complex	81	33	
Leatherleaf-Sweet Gale Shore Fen	68	28	
Dogwood-Pussy Willow Swamp	59	24	
Speckled Alder Swamp	34	14	
Northern Tamarack Rich Swamp	24	10	
Deep Marsh Mosaic/Complex	15	6	
Bog Birch-Willow Shore Fen	8	3	
Leatherleaf Bog	6	3	
Black Spruce/Labrador Tea Poor Swamp (evergreen phase)	6	2	
Midwest Cattail Deep Marsh	4	2	
Black Spruce/Labrador Tea Poor Swamp (mixed phase)	3	1	
Quaking Aspen-Paper Birch Forest	3	1	
Black Spruce/Alder Rich Swamp	1	1	
Small Island with Shrubs	1	0	
Wild Rice Marsh	1	0	
Trembling Aspen-Balsam Poplar Lowland Forest	1	0	
TOTAL	470	190	
Geology / Soils Metasedimentary rocks, undivided - biotite-quartz-plagioclase schist and metagraywacke.			
Water Resources None			
Flood Plain / Wetlands 470 acres (see above)			
Wildlife / Fisheries None Known			
Threatened / Endangered / Sensitive Species		Animals	None Known
		Plants	None Known
Proposed Wilderness Yes			
Park Facilities and Operations None			

Name of the Unit: East Daley (Brook) II, 2005

Area: 56 ac (23 ha)

Type of Burn: Understory burn

Fuels: Timber – 60-70 year old red pine, jack pine, and mixed conifer stands

<i>Vegetation</i> Type	Area, ac	Area, ha	Percent of Unit	NFFL Fuel Model	CFFDRS Fuel Type
Aspen-mixed conifer	25	10	44	2 / 8 *	D-1 / M-2 *
Jack pine	26	11	47	9	C-3
Red pine	5	2	9	9	C-5

* 2 and D-1 for leaves absent condition; 8 and M-2 for leaves present condition

General Descriptive Location: T 69N R 20W Sec. 32; south-central portion of the Park, near Daley Bay on the east end of Kabetogama Lake, approximately 1.0 mi (1.6 km) north of the Park boundary; all boundaries are wetland brush and swamp conifers; elevation ranges from 1120 to 1175 ft (341 to 358 m) with mostly 10% slopes on east and west aspects. Note: the Unit is divided into Sub-units 1, 2, and 3.

Purpose of the Burn: Hazard fuel reduction; also, ecosystem management – replicate a natural, low-intensity fire in this fire-adapted ecosystem.

Vegetation Type	Acres	Hectares	
Quaking Aspen-Paper Birch Forest	22	9	
Trembling Aspen-Balsam Poplar Lowland Forest	10	4	
White Pine-Red Pine-Quaking Aspen-Paper Birch Forest	9	4	
Boreal Pine Rocky Woodland (jack pine phase)	7	3	
Jack Pine-Aspen Forest Mosaic	6	2	
Boreal Pine Rocky Woodland (mixed pine phase)	1	0	
Black Ash-Mixed Hardwood Swamp	1	0	
Speckled Alder Swamp	1	0	
TOTAL	56	23	
Geology / Soils Lac La Croix granite - biotite granite.			
Water Resources None			
Flood Plain / Wetlands 12 acres (see above)			
Wildlife / Fisheries None Known			
Threatened / Endangered / Sensitive Species	Animals	None Known	
	Plants	None Known	
Proposed Wilderness Yes			
Park Facilities and Operations None			

Name of the Unit: Fennwick, 2005

Area: 1,083 ac (438 ha)

Type of Burn: Stand replacement

Fuels: Timber – jack pine – NFFL Fuel Model 9, CFFDRS Fuel Type C-3.

General Descriptive Location: T 70N R 21W Sec. 22

Purpose of the Burn: Jack pine stand replacement

Vegetation Type	Acres	Hectares	
Quaking Aspen-Paper Birch Forest	261	106	
Jack Pine/Balsam Fir Forest	209	84	
Spruce-Fir-Aspen Forest	142	57	
Jack Pine-Aspen Forest Mosaic	101	41	
Wet Meadow/Fen Mosaic/Complex	95	39	
Black Spruce/Feathermoss Forest	78	32	
Speckled Alder Swamp	43	18	
Deep Marsh Mosaic/Complex	39	16	
Black Spruce/Alder Rich Swamp	23	9	
Black Spruce/Labrador Tea Poor Swamp (evergreen phase)	21	8	
Spruce-Fir/Mountain Maple Forest	2	8	
Boreal Pine Rocky Woodland (jack pine phase)	12	5	
Black Spruce/Leatherleaf Semi-treed Bog	10	4	
Black Ash-Mixed Hardwood Swamp	7	3	
Black Spruce/Labrador Tea Poor Swamp (mixed phase)	7	3	
Leatherleaf-Sweet Gale Shore Fen	4	1	
Northern Water Lily Aquatic Wetland	3	1	
Boreal Pine Rocky Woodland (mixed pine phase)	3	1	
Canada Bluejoint Eastern Meadow	2	1	
White Cedar-(Mixed Conifer)/Alder Swamp (rich soil phase)	2	1	
Northern Tamarack Rich Swamp	1	0	
TOTAL	1083	438	
Geology / Soils Metasedimentary rocks, undivided - biotite-quartz-plagioclase schist and metagraywacke.			
Water Resources 2.39 km of streams			
Flood Plain / Wetlands 334 acres (see above)			
Wildlife / Fisheries None Known			
Threatened / Endangered / Sensitive Species		Animals	None Known
		Plants	None Known
Proposed Wilderness Yes			
Park Facilities and Operations None			

Name of the Unit: Whispering Pines IV, 2005

Area: 49 ac (20 ha)

Type of Burn: Understory burn

Fuels: Timber – red and white pine – NFFL Fuel Model 9, CFFDRS Fuel Type C-5.

General Descriptive Location: T 69N R 20W Sec. 25; just east of Whispering Pines III, south of the road to the Whispering Pines housing area and east of Meadwood Road, and east of Sullivan Bay; elevation between 1150 and 1265 ft (350 and 385 m); slopes generally 2-3% on short ridges with northeast and southwest aspects.

Purpose of the Burn: Hazard fuels reduction, and ecosystem management – allowing fire to play its natural role as an ecosystem process.

Vegetation Type	Acres	Hectares	
White Pine-Red Pine-Quaking Aspen-Paper Birch Forest	36	15	
Black Spruce/Feathermoss Forest	5	2	
Quaking Aspen-Paper Birch Forest	3	1	
Red Pine/Blueberry Dry Forest	3	1	
Boreal Pine Rocky Woodland (mixed pine phase)	1	0	
Spruce-Fir-Aspen Forest	1	0	
TOTAL	49	20	
Geology / Soils Granite-rich migmatite			
Water Resources None			
Flood Plain / Wetlands 5 acres (see above)			
Wildlife / Fisheries None Known			
Threatened / Endangered / Sensitive Species	Animals	None Known	
	Plants	None Known	
Proposed Wilderness No			
Park Facilities and Operations None			

FY 2006

Name of the Unit: Whiplash, 2006

Area: 618 ac (250 ha)

Type of Burn: Marsh grass

Fuels: Grass, brush.

General Descriptive Location: T 68N R 20W Sec. 5; Daley Brook, Daley Bay, Moxie Island.

Purpose of the Burn: To rejuvenate decadent willow and stimulate sprouting of willow species, to reduce annuals and dead herbaceous cover, to prevent build-up of debris on the marsh floor, to reduce the invasion of woody vegetation into this marsh ecosystem (may require several burns), and to foster a change in albedo that permits earlier spring growth.

Vegetation Type	Acres	Hectares	
Wet Meadow/Fen Mosaic/Complex	250	101	
Trembling Aspen-Balsam Poplar Lowland Forest	18	7	
Spruce-Fir-Aspen Forest	3	1	
Speckled Alder Swamp	22	9	
Quaking Aspen-Paper Birch Forest	7	3	
Midwest Pondweed Submerged Aquatic Wetland	3	1	
Midwest Cattail Deep Marsh	22	9	
Leatherleaf Bog	3	1	
Dogwood-Pussy Willow Swamp	234	95	
Deep Marsh Mosaic/Complex	42	17	
Boreal Pine Rocky Woodland (mixed pine phase)	4	2	
Boreal Hazelnut-Serviceberry Rocky Shrubland	1	0	
Black Ash-Mixed Hardwood Swamp	2	1	
TOTAL	618	250	
Geology / Soils Lac La Croix granite - biotite granite.			
Water Resources None			
Flood Plain / Wetlands 597 acres (see above)			
Wildlife / Fisheries None Known			
Threatened / Endangered / Sensitive Species	Animals	None Known	
	Plants	None Known	
Proposed Wilderness Yes			
Park Facilities and Operations None			

Name of the Unit: Maelstrom, 2006

Area: 1,265 ac (512 ha)

Type of Burn: Stand replacement

Fuels: Timber – jack pine – NFFL Fuel Model 9, CFFDRS Fuel Type C-3.

General Descriptive Location: T 69N R 19W Sec. 9.

Purpose of the Burn: Jack pine stand replacement.

VegetationType	Acres	Hectares	
Jack Pine-Aspen Forest Mosaic	344	139	
Quaking Aspen-Paper Birch Forest	253	102	
Jack Pine/Balsam Fir Forest	215	87	
Spruce-Fir-Aspen Forest	87	35	
Speckled Alder Swamp	51	21	
Boreal Pine Rocky Woodland (jack pine phase)	46	19	
Wet Meadow/Fen Mosaic/Complex	44	18	
Deep Marsh Mosaic/Complex	43	17	
White Pine-Red Pine-Quaking Aspen-Paper Birch Forest	33	13	
Black Spruce/Labrador Tea Poor Swamp (evergreen phase)	19	8	
Mixed Aspen Rocky Woodland	18	7	
Leatherleaf Bog	17	7	
Midwest Pondweed Submerged Aquatic Wetland	13	5	
Northern Water Lily Aquatic Wetland	10	4	
Black Spruce/Leatherleaf Semi-treed Bog	9	4	
Boreal Pine Rocky Woodland (mixed pine phase)	9	3	
Northern Tamarack Rich Swamp	8	3	
Black Spruce/Alder Rich Swamp	7	3	
Pin Oak-Bur Oak Rocky Woodland (mixed pine-oak phase)	6	3	
White Cedar-Yellow Birch Forest	5	2	
Boreal Hazelnut-Serviceberry Rocky Shrubland	4	2	
Spruce-Fir/Mountain Maple Forest	3	1	
Black Spruce/Labrador Tea Poor Swamp (mixed phase)	2	1	
Red Pine/Blueberry Dry Forest	2	1	
White Cedar-Boreal Conifer Mesic Forest	1	1	
Small Island with Trees	1	0	
Canada Bluejoint Eastern Meadow	1	0	
TOTAL	1265	512	
Geology / Soils	Mainly Schist-rich migamatite with Metasedimentary rocks		
Water Resources	3.28 km of streams		
Flood Plain / Wetlands	230 acres (see above)		
Wildlife / Fisheries	None Known		
Threatened / Endangered / Sensitive Species	Animals	1 Osprey nest	
	Plants	None Known	
Proposed Wilderness	Yes		
Park Facilities and Operations	None		

Name of the Unit: Whispering Pines V, 2006

Area: 77 ac (31 ha)

Type of Burn: Understory burn

Fuels: Timber – red and white pine – NFFL Fuel Model 9, CFFDRS Fuel Type C-5.

General Descriptive Location: T 69N R 20W Sec. 25; north and northeast of Whispering Pines III and IV, south of the road to the Whispering Pines housing area and east of Meadwood Road and Sullivan Bay; elevation between 1150 and 1265 ft (350 and 385 m); slopes generally 2-3% on short ridges with northeast and southwest aspects.

Purpose of the Burn: Hazard fuels reduction, and ecosystem management – allowing fire to play its natural role as an ecosystem process.

Vegetation Type	Acres	Hectares	
White Pine-Red Pine-Quaking Aspen-Paper Birch Forest	45	18	
Spruce-Fir-Aspen Forest	18	7	
Quaking Aspen-Paper Birch Forest	7	3	
Red Pine/Blueberry Dry Forest	3	1	
Speckled Alder Swamp	2	1	
Spruce-Fir/Mountain Maple Forest	2	1	
Trembling Aspen-Balsam Poplar Lowland Forest	1	0	
TOTAL	77	31	
Geology / Soils	Granite-rich migmatite and Schist-rich migamatite		
Water Resources	None		
Flood Plain / Wetlands	2 acres (see above)		
Wildlife / Fisheries	None Known		
Threatened / Endangered / Sensitive Species	Animals	None Known	
	Plants	None Known	
Proposed Wilderness	No		
Park Facilities and Operations	Seasonal Housing - 11 units		

Name of the Unit: Whispering Pines VI, 2006

Area: 14 ac (6 ha)

Type of Burn: Understory burn

Fuels: Timber – red and white pine – NFFL Fuel Model 9, CFFDRS Fuel Type C-5.

General Descriptive Location: T 69N R 20W Sec. 25; southeast of Whispering Pines I, south of the Ash River Visitor Center, west of Meadwood Road and across the road from Whispering Pines II and III; elevation between 1150 and 1265 ft (350 and 385 m); slopes generally 2-3% on short ridges with northeast and southwest aspects.

Purpose of the Burn: Hazard fuels reduction, and ecosystem management – allowing fire to play its natural role as an ecosystem process.

Vegetation Type	Acres	Hectares	
White Pine/Mountain Maple Mesic Forest	7	3	
Quaking Aspen-Paper Birch Forest	5	2	
Black Ash-Mixed Hardwood Swamp	1	1	
TOTAL	14	6	
Geology / Soils	Granite-rich migmatite		
Water Resources	0.17 km of streams		
Flood Plain / Wetlands	2 acres (see above)		
Wildlife / Fisheries	None Known		
Threatened / Endangered / Sensitive Species	Animals	None Known	
	Plants	None Known	
Proposed Wilderness	No		
Park Facilities and Operations	None		

Alternate Burn Units

Name of the Unit: Blind Ash Bay (Alternate, Potential Fire Re-entry)

Area: 333 ac (135 ha)

Type of Burn: Understory burn

Fuels: Mixed Pine – NFFL Fuel Model 9, CFFDRS Fuel Type C-5.

General Descriptive Location: T 69N R 20W Sec. 25, 26, 35, 36; east end of Lake Kabetogama on the west end of Kabetogama Narrows; 1.5 mi (2.4 km) long in a northwest-to-southeast direction and 0.5 mi (0.8 km) wide; northern boundary is Lake Kabetogama, a portion of the western is Blind Ash Bay, the southwestern is a wetland containing several beaver ponds, and the eastern is the Meadwood Road and the service road into the Ash River maintenance area; 0.75 mi (1.2 km) north of the park boundary.

Purpose of the Burn: Hazard fuels reduction, promotion of pine regeneration, and ecosystem management – allowing fire to play its natural role as an ecosystem process.

Vegetation Type	Acres	Hectares	
White Pine-Red Pine-Quaking Aspen-Paper Birch Forest	115	47	
Quaking Aspen-Paper Birch Forest	33	13	
Red Pine/Blueberry Dry Forest	24	10	
White Pine/Mountain Maple Mesic Forest	23	9	
Spruce-Fir-Aspen Forest	19	8	
Wet Meadow/Fen Mosaic/Complex	17	7	
Spruce-Fir/Mountain Maple Forest	16	6	
Trembling Aspen-Balsam Poplar Lowland Forest	16	6	
Boreal Pine Rocky Woodland (mixed pine phase)	13	5	
Black Spruce/Feathermoss Forest	9	4	
Northern Water Lily Aquatic Wetland	9	3	
Speckled Alder Swamp	8	3	
Black Ash-Mixed Hardwood Swamp	7	3	
Canada Bluejoint Eastern Meadow	6	2	
Deep Marsh Mosaic/Complex	5	2	
Leatherleaf Bog	4	2	
Boreal Pine Rocky Woodland (jack pine phase)	2	1	
Poverty Grass Granite Barrens	2	1	
Northern Tamarack Rich Swamp	1	0	
TOTAL	333	135	
Geology / Soils	Granite-rich migmatite, Schist-rich migmatite, and Lac La Croix granite		
Water Resources	None		
Flood Plain / Wetlands	66 acres (see above)		
Wildlife / Fisheries	None Known		
Threatened / Endangered / Sensitive Species	Animals	None Known	
	Plants	None Known	
Proposed Wilderness	No		
Park Facilities and Operations	None		

Name of the Unit: Moose Bay (Alternate, Potential Fire Re-entry)

Area: 235 ac (95 ha)

Type of Burn: Understory burn

Fuels: Mixed jack, red, and white pine – NFFL Fuel Model 9,8, CFFDRS Fuel Type C-3, M-2.

General Descriptive Location: T 69N R 19W Sec. 26,27,34; near the southwestern end of Namakan Lake, on a peninsula between Moose Bay and Hoist Bay; about 1.0 mi (1.6 km) long in a north-to-south direction, about 0.75 mi (1.2 km) wide, and $\frac{3}{4}$ surrounded by water; an early 1900s railroad grade and road is the southern control line and unit boundary; approximately 2 mi (3.2 km) east of the community of Ash River and about 1 mi (1.6 km) north of the park boundary.

Purpose of the Burn: Hazard fuels reduction, promotion of pine regeneration, and ecosystem management – allowing fire to play its natural role as an ecosystem process.

Vegetation Type	Acres	Hectares	
Jack Pine-Aspen Forest Mosaic	47	19	
Jack Pine/Balsam Fir Forest	46	19	
Quaking Aspen-Paper Birch Forest	45	18	
White Pine-Red Pine-Quaking Aspen-Paper Birch Forest	33	13	
Boreal Pine Rocky Woodland (jack pine phase)	27	11	
Leatherleaf Bog	12	5	
Mixed Aspen Rocky Woodland	5	2	
Spruce-Fir-Aspen Forest	5	2	
Pin Oak-Bur Oak Rocky Woodland (mixed pine-oak phase)	3	1	
Deep Marsh Mosaic/Complex	3	1	
Boreal Hazelnut-Serviceberry Rocky Shrubland	2	1	
Boreal Pine Rocky Woodland (mixed pine phase)	2	1	
Black Spruce/Leatherleaf Semi-treed Bog	2	1	
Black Spruce/Feathermoss Forest	2	1	
Trembling Aspen-Balsam Poplar Lowland Forest	1	0	
TOTAL	235	95	
Geology / Soils Mainly Schist-rich migmatite with Granite-rich migmatite			
Water Resources None			
Flood Plain / Wetlands 21 acres (see above)			
Wildlife / Fisheries None Known			
Threatened / Endangered / Sensitive Species	Animals	None Known	
	Plants	None Known	
Proposed Wilderness No			
Park Facilities and Operations None			

Name of the Unit: Mica Bay (Alternate, Potential Fire Re-entry)

Area: 23 ac (9 ha)

Type of Burn: Understory burn

Fuels: Mixed red and white pine – NFFL Fuel Model 9 CFFDRS Fuel Type C-5.

General Descriptive Location: T 70N R 18W Sec. 31; on the eastern end of Mica Bay at the northern end of Namakan Lake; bordered by natural barriers on three sides: to the west a drainage flows south to Namakan Lake, to the north is a flooded wetland, to the south is Mica Bay, and to the east is a depression which runs north- south connecting the flooded wetland with Mica Bay; approximately 0.75 mi (1.2 km) south of the park boundary.

Purpose of the Burn: Hazard fuels reduction, promotion of pine regeneration, and ecosystem management – allowing fire to play its natural role as an ecosystem process.

Vegetation Type	Acres	Hectares	
White Pine/Mountain Maple Mesic Forest	18	7	
White Pine-Red Pine-Quaking Aspen-Paper Birch Forest	4	2	
Beaver Basin Break-up Mosaic	1	0	
TOTAL	23	9	
Geology / Soils Metasedimentary rocks, undivided - biotite-quartz-plagioclase schist and metagraywacke.			
Water Resources None			
Flood Plain / Wetlands 1 acre (see above)			
Wildlife / Fisheries None Known			
Threatened / Endangered / Sensitive Species	Animals	None Known	
	Plants	None Known	
Proposed Wilderness No			
Park Facilities and Operations None			

Name of the Unit: Willow (Alternate, Potential Fire Re-entry)

Area: 40 ac (16 ha)

Type of Burn: Grass/Brush burn

Fuels: Grass/Brush – NFFL Fuel Model 3 CFFDRS Fuel Type 0-1b.

General Descriptive Location: T 68N R 20W Sec. 2; on the south side of Kabetogama Lake along the east side of Daley Brook; approximately 1.2 mi (1.9 km) long in a north-to-south direction and averaging about 300 feet wide; bordered by water on the western side and by hardwood forest (aspen and swamp hardwoods) on the eastern side; approximately 0.6 mi (1.0 km) south of the park boundary.

Purpose of the Burn: To rejuvenate decadent willow and stimulate sprouting of willow species, to reduce annuals and dead herbaceous cover, to prevent build-up of debris on the marsh floor, to reduce the invasion of woody vegetation into this marsh ecosystem (may require multiple burns), and to foster a change in albedo that permits earlier spring growth.

Vegetation Type	Acres	Hectares	
Dogwood-Pussy Willow Swamp	11	5	
Trembling Aspen-Balsam Poplar Lowland Forest	9	4	
Deep Marsh Mosaic/Complex	7	3	
Quaking Aspen-Paper Birch Forest	4	2	
Eastern Reed Marsh	2	1	
Wet Meadow/Fen Mosaic/Complex	2	1	
Mixed Aspen Rocky Woodland	2	1	
Speckled Alder Swamp	2	1	
TOTAL	40	16	
Geology / Soils Lac La Croix granite			
Water Resources None			
Flood Plain / Wetlands 34 acres (see above)			
Wildlife / Fisheries None Known			
Threatened / Endangered / Sensitive Species	Animals	None Known	
	Plants	None Known	
Proposed Wilderness No			
Park Facilities and Operations None			

Name of the Unit: Daley Brook West (Alternate, Potential Fire Re-entry)

Area: 48 ac (19 ha)

Type of Burn: Grass/Brush burn

Fuels: Grass/Brush – NFFL Fuel Model 3, CFFDRS Fuel Type 0-1b.

General Descriptive Location: T 69N R 20W Sec. 31 on the south side of Kabetogama Lake and along the west side of Daley Brook; approximately 0.75 mi (1.2 km) long in a north-to-south direction and averaging 100 feet wide; bordered by Daley Brook on the eastern side and hardwood forest on the western and southern sides; 0.5 mi (0.8 km) north of the park boundary.

Purpose of the Burn: To rejuvenate decadent willow and stimulate sprouting of willow species, to reduce annuals and dead herbaceous cover, to prevent build-up of debris on the marsh floor, to reduce the invasion of woody vegetation into this marsh ecosystem (may require multiple burns), and to foster a change in albedo that permits earlier spring growth

Vegetation Type	Acres	Hectares	
Dogwood-Pussy Willow Swamp	20	8	
Wet Meadow/Fen Mosaic/Complex	8	3	
Trembling Aspen-Balsam Poplar Lowland Forest	8	3	
Quaking Aspen-Paper Birch Forest	3	1	
Spruce-Fir-Aspen Forest	3	1	
Boreal Pine Rocky Woodland (mixed pine phase)	2	1	
Deep Marsh Mosaic/Complex	2	1	
TOTAL	48	19	
Geology / Soils Lac La Croix granite			
Water Resources None			
Flood Plain / Wetlands 31 acres (see above)			
Wildlife / Fisheries None Known			
Threatened / Endangered / Sensitive Species	Animals	None Known	
	Plants	None Known	
Proposed Wilderness No			
Park Facilities and Operations None			

Name of the Unit: Randolph Bay (Alternate)

Area: 436 ac (177 ha)

Type of Burn: Understory burn

Fuels: Timber – 100-120 year old white pine, and mixedwood – NFFL Fuel Models 8 and 9, CFFDRS Fuel Types C-5 and M-1.

General Descriptive Location: T 69N R 18W Sec. 28; south of Randolph Bay between Namakan Lake and Johnson Lake.

Purpose of the Burn: Hazard fuel reduction to prevent a stand-replacement fire; also, ecosystem management – replicate a natural, low-intensity surface fire that will kill hardwoods and brush regeneration and stimulate regeneration of white pine.

Vegetation Type	Acres	Hectares	
Boreal Pine Rocky Woodland (mixed pine phase)	87	35	
Quaking Aspen-Paper Birch Forest	69	28	
Spruce-Fir-Aspen Forest	68	27	
White Pine-Red Pine-Quaking Aspen-Paper Birch Forest	44	18	
Jack Pine-Aspen Forest Mosaic	28	11	
Wet Meadow/Fen Mosaic/Complex	22	9	
Mixed Aspen Rocky Woodland	20	8	
Speckled Alder Swamp	18	7	
Leatherleaf Bog	18	7	
Northern Water Lily Aquatic Wetland	8	3	
Black Spruce/Leatherleaf Semi-treed Bog	7	3	
Black Spruce/Feathermoss Forest	7	3	
Deep Marsh Mosaic/Complex	7	3	
White Pine/Mountain Maple Mesic Forest	6	3	
Canada Bluejoint Eastern Meadow	5	2	
Pin Oak-Bur Oak Rocky Woodland (mixed pine-oak phase)	4	2	
Boreal Pine Rocky Woodland (jack pine phase)	4	1	
Jack Pine/Balsam Fir Forest	3	1	
Midwest Pondweed Submerged Aquatic Wetland	3	1	
Spruce-Fir/Mountain Maple Forest	3	1	
Boreal Hazelnut-Serviceberry Rocky Shrubland	1	0	
TOTAL	436	177	
Geology / Soils Mainly Granite-rich migmatite with Schist-rich migmatite			
Water Resources None			
Flood Plain / Wetlands 98 acres (see above)			
Wildlife / Fisheries None Known			
Threatened / Endangered / Sensitive Species	Animals	None Known	
	Plants	None Known	
Proposed Wilderness Yes			
Park Facilities and Operations 1 campsite			

Name of the Unit: Net Lake West (Alternate)

Area: 96 ac (39 ha)

Type of Burn: Understory burn

Fuels: Timber – white and red pine, and mixedwood – NFFL Fuel Models 9 and 8, CFFDRS Fuel Types C-5 and M-1.

General Descriptive Location: T 68N R 18W Sec. 4; near Net Lake and Tooth Lake.

Purpose of the Burn: Hazard fuel reduction; also, ecosystem management – replicate a natural, low-intensity fire in this fire-adapted ecosystem.

Vegetation Type	Acres	Hectares	
Spruce-Fir-Aspen Forest	29	12	
White Cedar-Boreal Conifer Mesic Forest	15	6	
Leatherleaf-Sweet Gale Shore Fen	12	5	
Spruce-Fir/Mountain Maple Forest	11	5	
Canada Bluejoint Eastern Meadow	11	4	
Wet Meadow/Fen Mosaic/Complex	7	3	
White Pine-Red Pine-Quaking Aspen-Paper Birch Forest	5	2	
Speckled Alder Swamp	2	1	
Jack Pine/Balsam Fir Forest	2	1	
TOTAL	96	39	
Geology / Soils Mainly Schist-rich migamatite with Granite-rich migmatite			
Water Resources None			
Flood Plain / Wetlands 32 acres (see above)			
Wildlife / Fisheries None Known			
Threatened / Endangered / Sensitive Species	Animals	None Known	
	Plants	None Known	
Proposed Wilderness Yes			
Park Facilities and Operations None			

Name of the Unit: Wiyapka (Alternate)

Area: 652 ac (264 ha)

Type of Burn: Understory burn

Fuels: Timber – 60-70 year old white pine

Vegetation Type	Area, ac	Area, ha	Percent of Unit	NFFL Fuel Model	CFFDRS Fuel Type
Aspen-birch	143	58	22	2 / 8	D-1 / M-2
Spruce-fir	92	37	14	10	C-2
White pine	170	69	26	9	C-5
Lowland shrub	234	95	36	3	O-1b

General Descriptive Location: T 68N R 18W Sec. 5; 0.5 mi (0.8 km) southwest of Junction Bay; the boundary is Wiyapka Lake and wetland drainages; elevation ranges from 1150 to 1280 ft (350 to 390 m) with rolling, mostly 10% slopes on north / south aspects and no major ridges.

Purpose of the Burn: Hazard fuel reduction.

Vegetation Type	Acres	Hectares	
White Pine-Red Pine-Quaking Aspen-Paper Birch Forest	168	68	
Spruce-Fir-Aspen Forest	106	43	
Wet Meadow/Fen Mosaic/Complex	98	40	
Spruce-Fir/Mountain Maple Forest	42	17	
Quaking Aspen-Paper Birch Forest	34	15	
Deep Marsh Mosaic/Complex	31	12	
Leatherleaf Bog	27	11	
Pin Oak-Bur Oak Rocky Woodland (mixed pine-oak phase)	26	11	
Northern Water Lily Aquatic Wetland	23	9	
Black Spruce/Labrador Tea Poor Swamp (mixed phase)	15	6	
Canada Bluejoint Eastern Meadow	14	6	
Mixed Aspen Rocky Woodland	13	5	
Northern Tamarack Rich Swamp	11	4	
Boreal Pine Rocky Woodland (mixed pine phase)	8	3	
Black Ash-Mixed Hardwood Swamp	8	3	
Speckled Alder Swamp	7	3	
Black Spruce/Leatherleaf Semi-treed Bog	6	2	
White Pine/Mountain Maple Mesic Forest	5	2	
Boreal Pine Rocky Woodland (jack pine phase)	4	2	
Boreal Hazelnut-Serviceberry Rocky Shrubland	4	2	
TOTAL	652	264	
Geology / Soils	Granite-rich migmatite and Schist-rich migmatite		
Water Resources	None		
Flood Plain / Wetlands	254 acres (see above)		
Wildlife / Fisheries	None Known		
Threatened / Endangered / Sensitive Species	Animals	None Known	
	Plants	None Known	
Proposed Wilderness	Yes		
Park Facilities and Operations	None		

Name of the Unit: Junction Bay West (Alternate)

Area: 264 ac (107 ha)

Type of Burn: Understory burn

Fuels: Timber – mixedwood and mixed conifer

Vegetation Type	Area, ac	Area, ha	Percent of Unit	NFFL Fuel Model	CFFDRS Fuel Type
Aspen-birch	66	27	25	8	M-2
Spruce-fir	124	50	47	9	C-2
Wetland grass	71	29	27	3	O-1b

General Descriptive Location: T 69N R 18W Sec. 32; along the south shore of the west end of Namakan Lake; boundaries are Namakan Lake to the north, Junction Bay to the east, and wetland areas to the south and west; elevation ranges from 1110 to 1230 ft (340 to 375 m); rolling topography averaging 7% slopes on southeast to northwest ridges with east and west aspects.

Purpose of the Burn: Hazard fuel reduction.

VegetationType	Acres	Hectares	
Spruce-Fir-Aspen Forest	92	37	
Quaking Aspen-Paper Birch Forest	73	30	
Black Spruce/Leatherleaf Semi-treed Bog	14	6	
White Pine-Red Pine-Quaking Aspen-Paper Birch Forest	12	5	
Wet Meadow/Fen Mosaic/Complex	12	5	
Pin Oak-Bur Oak Rocky Woodland (mixed pine-oak phase)	10	4	
Leatherleaf Bog	10	4	
Black Ash-Mixed Hardwood Swamp	8	3	
Trembling Aspen-Balsam Poplar Lowland Forest	6	3	
Boreal Pine Rocky Woodland (mixed pine phase)	5	2	
Speckled Alder Swamp	5	2	
Spruce-Fir/Mountain Maple Forest	5	2	
Northern Water Lily Aquatic Wetland	3	1	
Black Spruce/Labrador Tea Poor Swamp (evergreen phase)	3	1	
Boreal Hazelnut-Serviceberry Rocky Shrubland	2	1	
Black Spruce/Feathermoss Forest	1	0	
TOTAL	264	107	
Geology / Soils	Schist-rich migamatite - Dominantly biotite schist paleosome.		
Water Resources	None		
Flood Plain / Wetlands	43 acres (see above)		
Wildlife / Fisheries	None Known		
Threatened / Endangered / Sensitive Species	Animals	None Known	
	Plants	None Known	
Proposed Wilderness	Yes		
Park Facilities and Operations	None		

Name of the Unit: Spring Lake (Alternate)

Area: 836 ac (338 ha) – 635 ac (257 ha) VNP and 201 ac (81 ha) SUF

Type of Burn: Understory burn

Fuels: Timber – 60-70 yr old white pine mixed with aspen, birch, and red maple

Vegetation Type	Area, ac	Area, ha	Percent of Unit	NFFL Fuel Model	CFFDRS Fuel Type
Aspen-birch	25	10	3	8 / 9 *	M-2 / D-1 *
Mixedwood	259	105	31	8	M-1
Mixed pine	226	91	27	9	C-5
Jack pine	192	78	23	9	C-3
Black spruce	59	24	7	--	--
Wetland grass	75	30	9	3	O-1b

* 8 and M-2 for leaf on conditions; 9 and D-1 for leaf off conditions

General Descriptive Location: T 68N R 18W Sec. 10; in the southeastern portion of the Park along the southern boundary, approximately 10 mi (16 km) northwest of Crane Lake, 8 mi (13 km) east-southeast of the Ash River Community, and 4 mi (6 km) south of the Canadian border; includes 201 ac (81 ha) of Superior National Forest land; elevation ranges from 1,160 to 1,360 ft (354 to 415 m) with mostly 10% slopes and short ridges with southeast / northwest aspects.

Purpose of the Burn: Hazard fuel reduction, and ecosystem management – allowing fire to play its natural role as an ecosystem process.

Vegetation Type	Acres	Hectares	
Jack Pine-Aspen Forest Mosaic	218	88	
White Pine-Red Pine-Quaking Aspen-Paper Birch Forest	134	54	
Pin Oak-Bur Oak Rocky Woodland (mixed pine-oak phase)	99	40	
Quaking Aspen-Paper Birch Forest	83	33	
Boreal Pine Rocky Woodland (mixed pine phase)	78	31	
Black Spruce/Labrador Tea Poor Swamp (evergreen phase)	45	18	
Boreal Pine Rocky Woodland (jack pine phase)	25	10	
Wet Meadow/Fen Mosaic/Complex	24	10	
Mixed Aspen Rocky Woodland	23	9	
Jack Pine/Balsam Fir Forest	19	8	
Spruce-Fir/Mountain Maple Forest	14	6	
Speckled Alder Swamp	13	5	
Canada Bluejoint Eastern Meadow	11	4	
Spruce-Fir-Aspen Forest	10	4	
Black Ash-Mixed Hardwood Swamp	10	4	
Leatherleaf Bog	8	3	
Pin Oak-Bur Oak Rocky Woodland (deciduous phase)	5	2	
Midwest Pondweed Submerged Aquatic Wetland	4	2	
Deep Marsh Mosaic/Complex	3	1	
Beaver Basin Break-up Mosaic	2	1	
Black Spruce/Alder Rich Swamp	1	1	
Leatherleaf-Sweet Gale Shore Fen	1	1	
TOTAL	836	338	
Geology / Soils		Schist-rich migamatite and Lac La Croix Granite	

Water Resources	None	
Flood Plain / Wetlands	123 acres (see above)	
Wildlife / Fisheries	None Known	
Threatened / Endangered / Sensitive Species	Animals	None Known
	Plants	None Known
Proposed Wilderness	Yes	
Park Facilities and Operations	None	

Name of the Unit: Roothouse Pete (Alternate)

Area: 552 ac (224 ha)

Type of Burn: Understory burn

Fuels: Timber – red and white pine – NFFL Fuel Model 9, CFFDRS Fuel Type C-5.

General Descriptive Location: T 68N R 20W Sec. 4

Purpose of the Burn: Hazard fuel reduction.

Vegetation Type	Acres	Hectares	
Quaking Aspen-Paper Birch Forest	165	67	
Spruce-Fir-Aspen Forest	104	42	
Boreal Pine Rocky Woodland (jack pine phase)	62	25	
White Pine-Red Pine-Quaking Aspen-Paper Birch Forest	54	22	
Trembling Aspen-Balsam Poplar Lowland Forest	27	11	
White Cedar-Yellow Birch Forest	23	9	
Boreal Pine Rocky Woodland (mixed pine phase)	22	9	
White Cedar-Black Ash Swamp	19	8	
Speckled Alder Swamp	12	5	
Black Ash-Mixed Hardwood Swamp	11	4	
Jack Pine/Balsam Fir Forest	10	4	
Jack Pine/Lichen Rocky Barrens	8	3	
Spruce-Fir/Mountain Maple Forest	8	3	
Mixed Aspen Rocky Woodland	8	3	
White Cedar-Boreal Conifer Mesic Forest	7	3	
White Cedar-(Mixed Conifer)/Alder Swamp (rich soil phase)	6	2	
Jack Pine-Aspen Forest Mosaic	3	1	
Boreal Hazelnut-Serviceberry Rocky Shrubland	2	1	
Black Spruce/Labrador Tea Poor Swamp (evergreen phase)	1	0	
TOTAL	552	224	
Geology / Soils Lac La Croix granite - biotite granite.			
Water Resources 0.56 km of streams			
Flood Plain / Wetlands 72 acres (see above)			
Wildlife / Fisheries None Known			
Threatened / Endangered / Sensitive Species		Animals	None Known
		Plants	None Known
Proposed Wilderness Yes			
Park Facilities and Operations None			

Name of the Unit: Marion Bay / Finlander Bay (Alternate)

Area: 2,444 ac (989 ha)

Type of Burn: Understory burn

Fuels: Timber – red and white pine and mixedwood – NFFL Fuel Models 9 and 8, CFFDRS Fuel Types C-5 and M-1.

General Descriptive Location: T 70N R 20W Sec. 8

Purpose of the Burn: Hazard fuel reduction.

Vegetation Type	Acres	Hectares	
Spruce-Fir-Aspen Forest	507	205	
Quaking Aspen-Paper Birch Forest	423	171	
White Pine-Red Pine-Quaking Aspen-Paper Birch Forest	230	93	
Jack Pine-Aspen Forest Mosaic	209	84	
Spruce-Fir/Mountain Maple Forest	161	65	
Jack Pine/Balsam Fir Forest	159	64	
Pin Oak-Bur Oak Rocky Woodland (mixed pine-oak phase)	124	50	
Wet Meadow/Fen Mosaic/Complex	89	36	
Boreal Pine Rocky Woodland (mixed pine phase)	83	33	
White Pine/Mountain Maple Mesic Forest	82	33	
Black Spruce/Feathermoss Forest	56	23	
Deep Marsh Mosaic/Complex	48	19	
Pin Oak-Bur Oak Rocky Woodland (jack pine-oak phase)	41	17	
Black Spruce/Labrador Tea Poor Swamp (evergreen phase)	35	14	
Canada Bluejoint Eastern Meadow	33	13	
Speckled Alder Swamp	25	10	
Black Spruce/Alder Rich Swamp	24	10	
Midwest Pondweed Submerged Aquatic Wetland	24	10	
Black Ash-Mixed Hardwood Swamp	15	6	
Beaver Basin Break-up Mosaic	13	5	
Boreal Pine Rocky Woodland (jack pine phase)	13	5	
Northern Tamarack Rich Swamp	11	4	
Pin Oak-Bur Oak Rocky Woodland (deciduous phase)	11	4	
Leatherleaf Bog	10	4	
Trembling Aspen-Balsam Poplar Lowland Forest	2	1	
Water-Beaver Pond	2	1	
Boreal Hazelnut-Serviceberry Rocky Shrubland	2	1	
Mixed Aspen Rocky Woodland	2	1	
TOTAL	2444	989	
Geology / Soils Metasedimentary rocks, undivided - biotite-quartz-plagioclase schist and metagraywacke.			
Water Resources 2 acre beaver pond, 5.99 km of streams			
Flood Plain / Wetlands 385 acres (see above)			
Wildlife / Fisheries None Known			
Threatened / Endangered / Sensitive Species		Animals	1 Osprey nest
		Plants	None Known
Proposed Wilderness Yes			
Park Facilities and Operations 2 campsites			

Name of the Unit: Wiyapka Lake East (Alternate)

Area: 343 ac (139 ha)

Type of Burn: Understory burn

Fuels: Timber.

General Descriptive Location: T 69N R 18W Sec. 5; near Wiyapka Lake.

Purpose of the Burn: Hazard fuel reduction.

Vegetation Type	Acres	Hectares	
White Pine-Red Pine-Quaking Aspen-Paper Birch Forest	108	44	
Quaking Aspen-Paper Birch Forest	58	24	
Spruce-Fir-Aspen Forest	40	16	
Mixed Aspen Rocky Woodland	27	11	
Pin Oak-Bur Oak Rocky Woodland (mixed pine-oak phase)	21	9	
Wet Meadow/Fen Mosaic/Complex	17	7	
Boreal Pine Rocky Woodland (mixed pine phase)	15	6	
Northern Tamarack Rich Swamp	13	5	
Black Spruce/Labrador Tea Poor Swamp (evergreen phase)	10	4	
Spruce-Fir/Mountain Maple Forest	9	4	
Deep Marsh Mosaic/Complex	6	2	
Boreal Pine Rocky Woodland (jack pine phase)	6	2	
Speckled Alder Swamp	3	1	
Jack Pine-Aspen Forest Mosaic	3	1	
Pin Oak-Bur Oak Rocky Woodland (deciduous phase)	3	1	
Canada Bluejoint Eastern Meadow	2	1	
Black Spruce/Feathermoss Forest	2	1	
TOTAL	343	139	
Geology / Soils	Granite-rich migmatite		
Water Resources	2 acre pond		
Flood Plain / Wetlands	52 acres (see above)		
Wildlife / Fisheries	None Known		
Threatened / Endangered / Sensitive Species	Animals	None Known	
	Plants	None Known	
Proposed Wilderness	Yes		
Park Facilities and Operations	None		

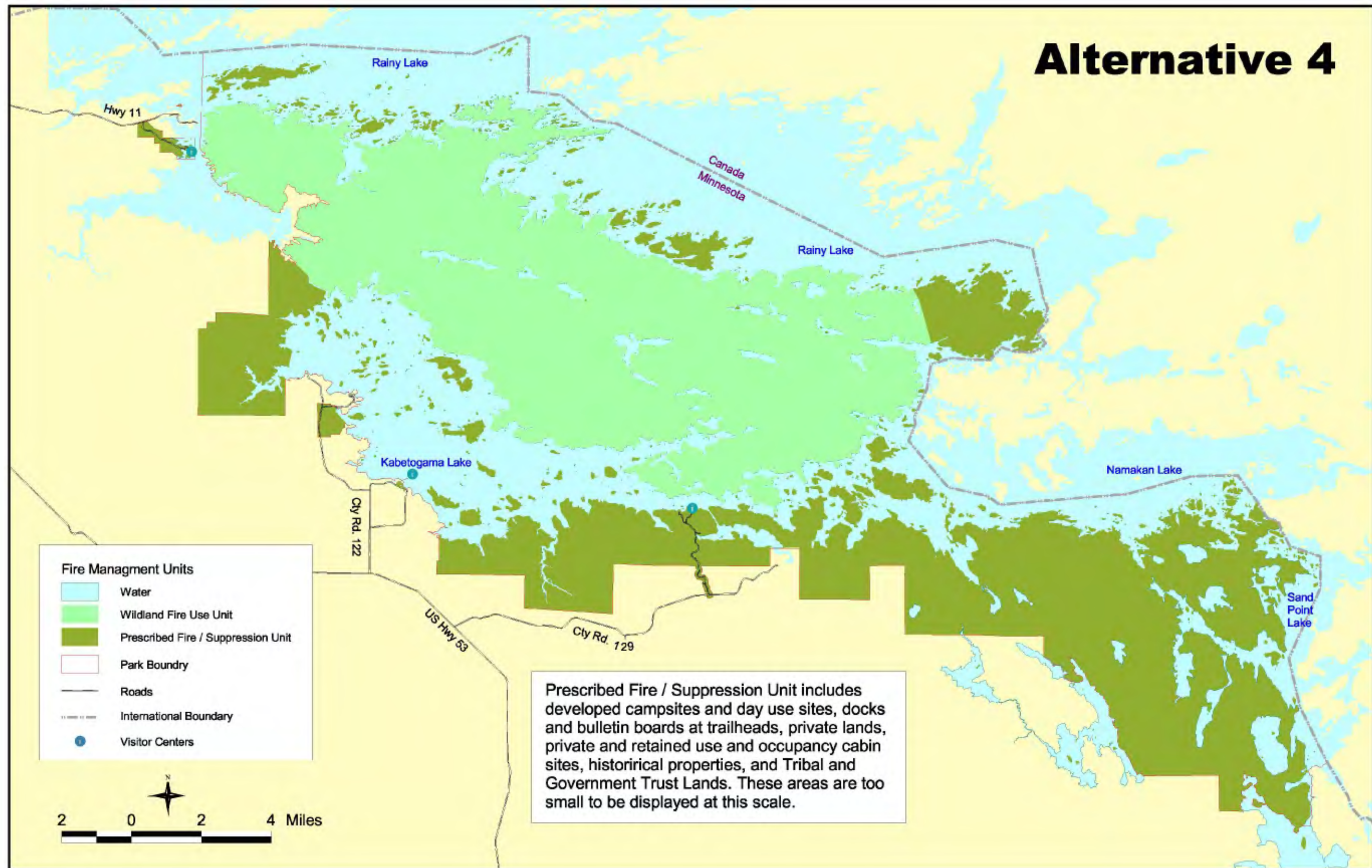


Figure 3 – Wildland FMP Fire Management Units (Alternative 4 in EA)

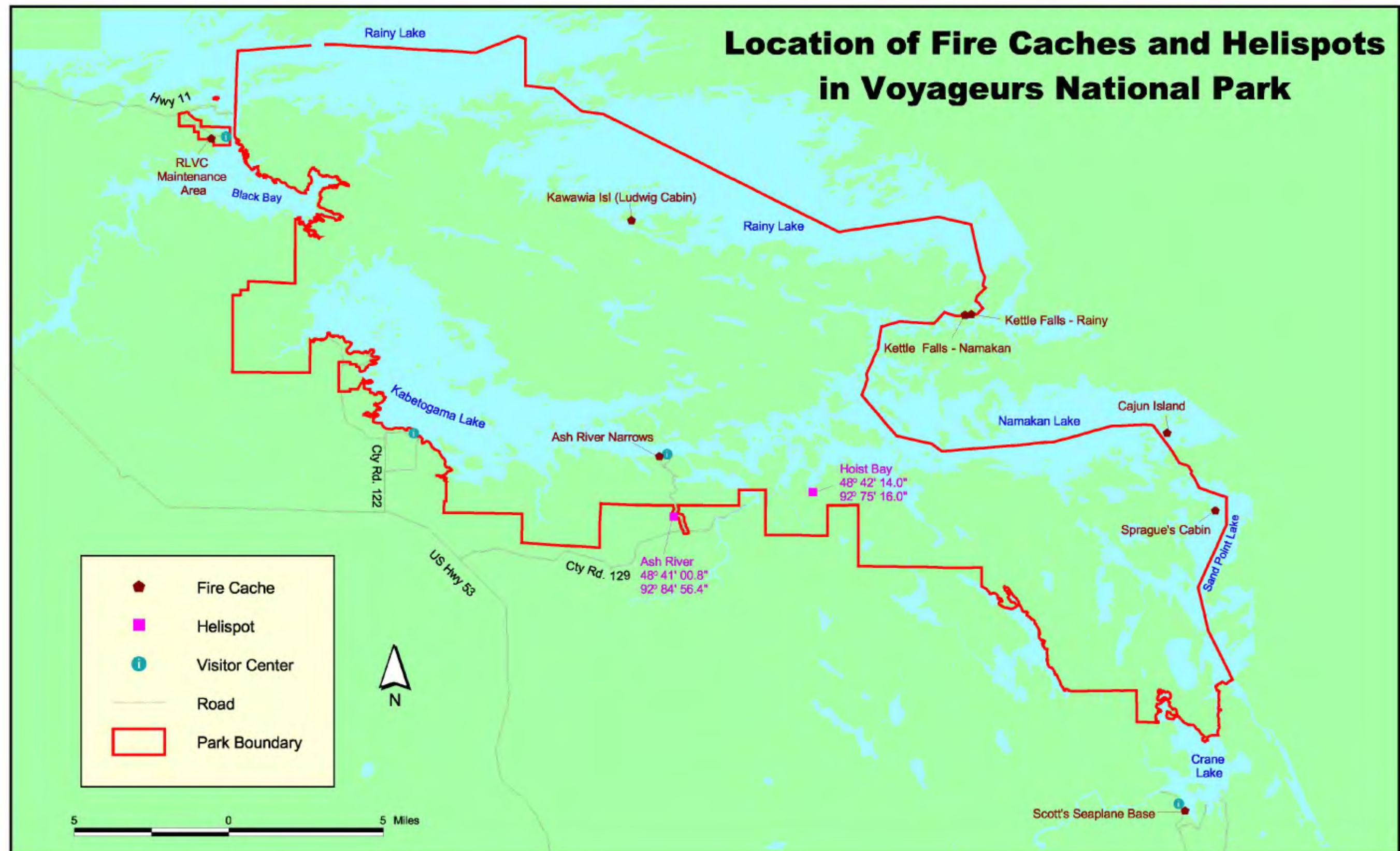


Figure G-1 – Voyageurs National Park Cache Location and Helibase Map



Figure H-1 – Five-Year Burn Plan Units

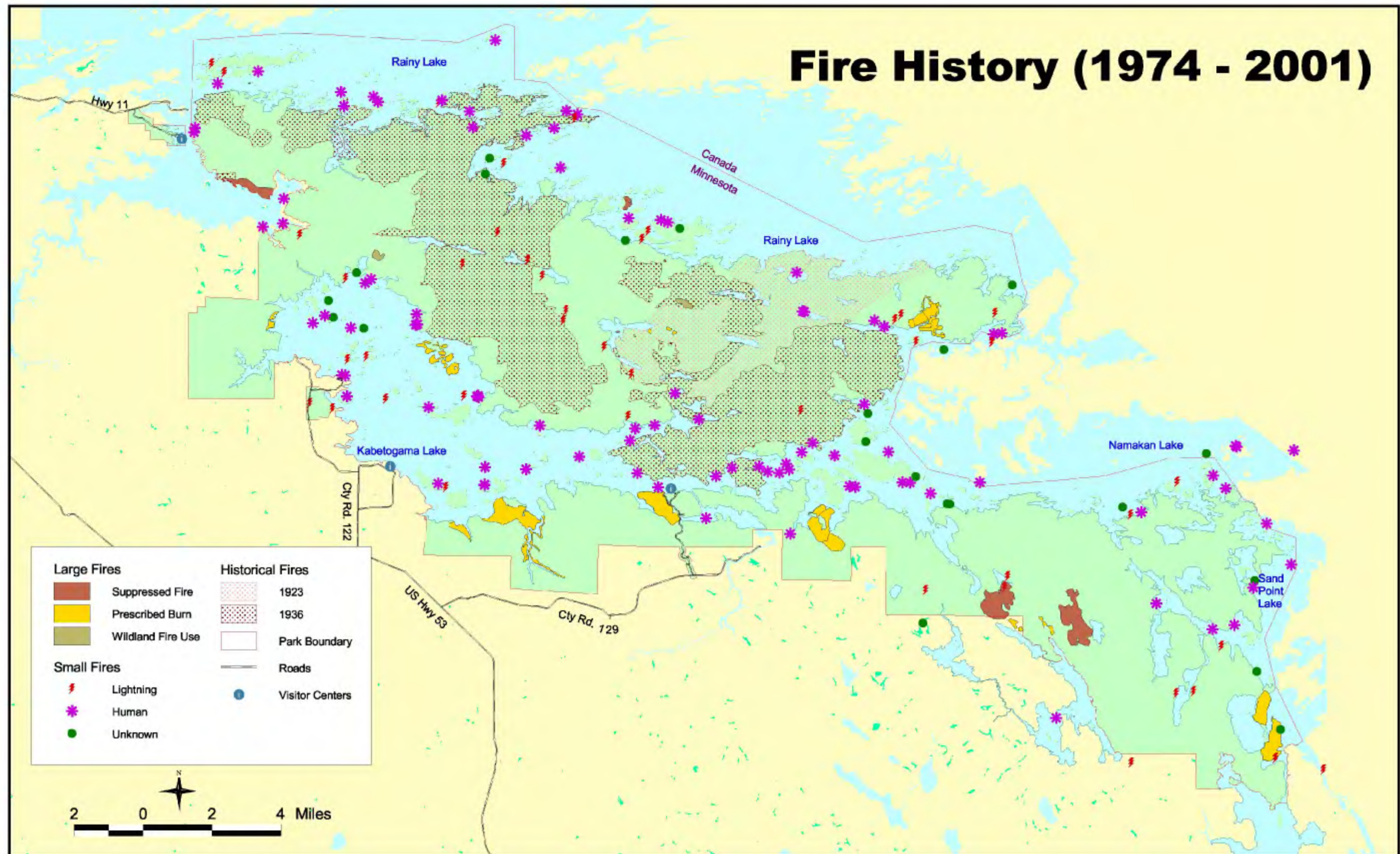


Figure I-1 – Voyageurs National Park Fire Occurrence

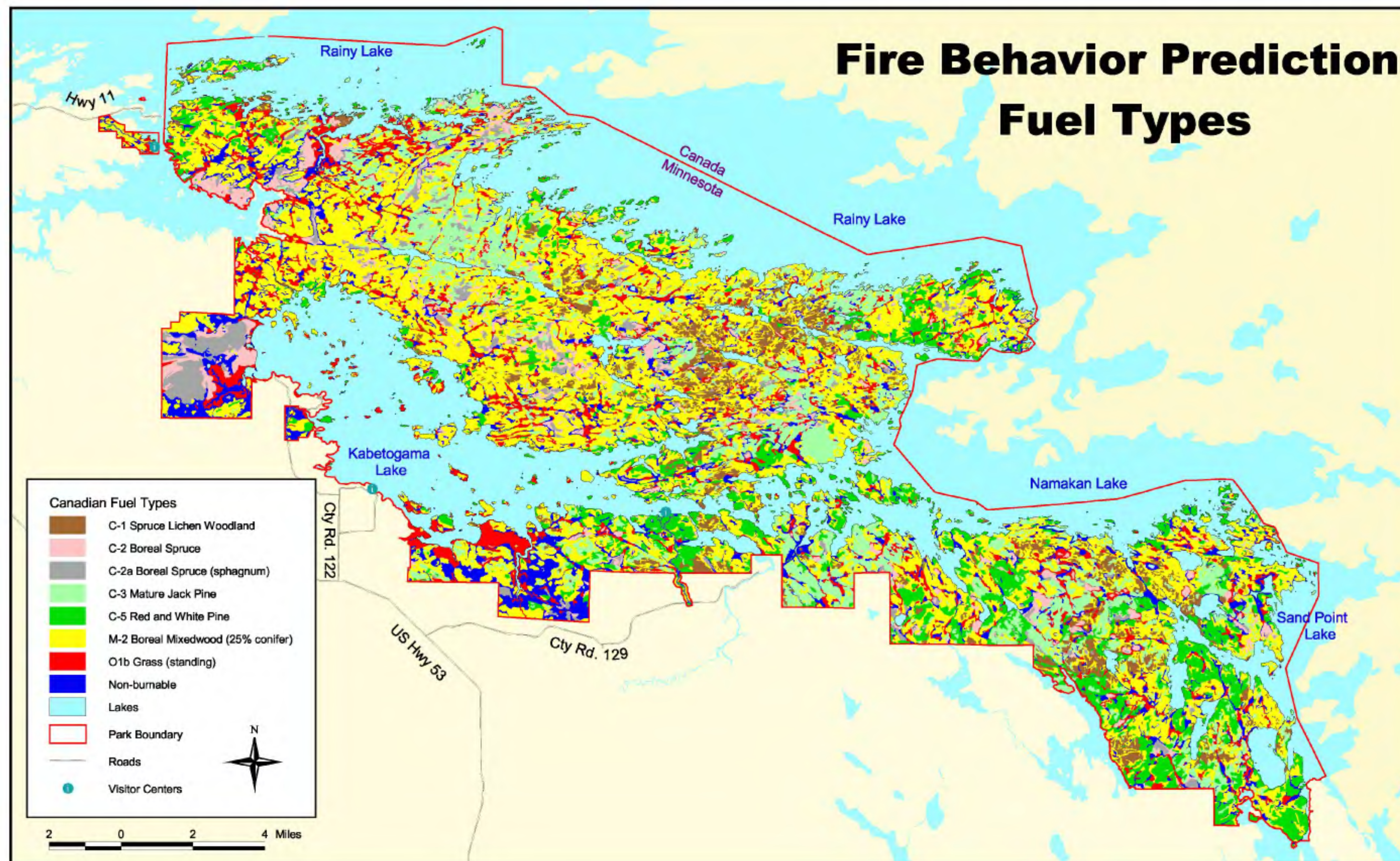
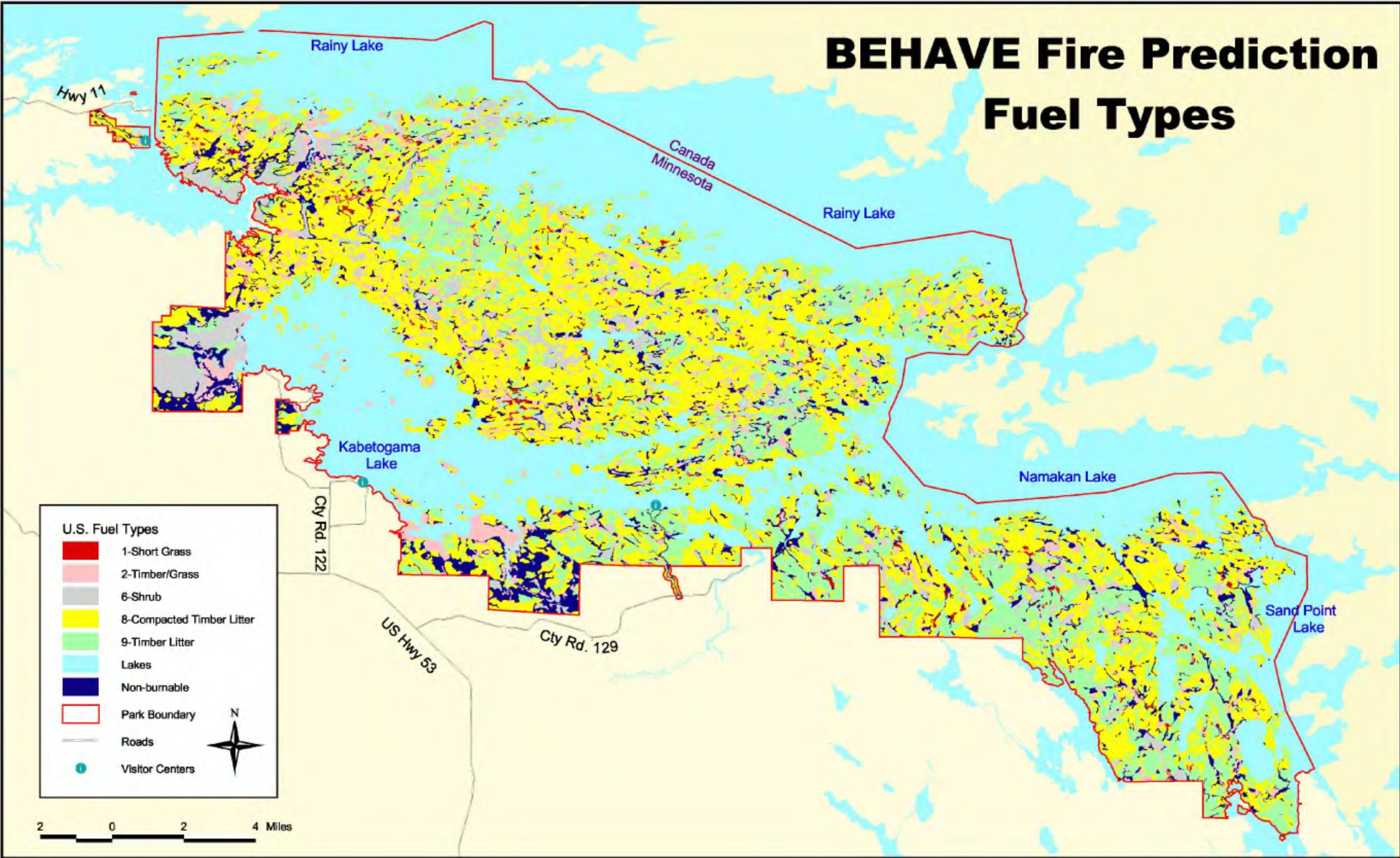


Figure I-2 – Voyageurs National Park, Canadian Fuel Model Map



Figure

Voyageurs National Park, U.S. Fuel Model Map